



Redfern North Eveleigh Paint Shop Precinct

Bridge catchment analysis

19 April 2023 | Version 3.0

Quality Assurance

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Version	Date	Details
1.0	11 October 2021	Issued to TfNSW
2.0	18 April 2023	Updated to reflect bridge design
3.0	19 April 2023	Refinement of land-use areas to rezoning approval

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Questions to be answered

Is there a need and/or benefit of an active transport bridge between North and South Eveleigh?

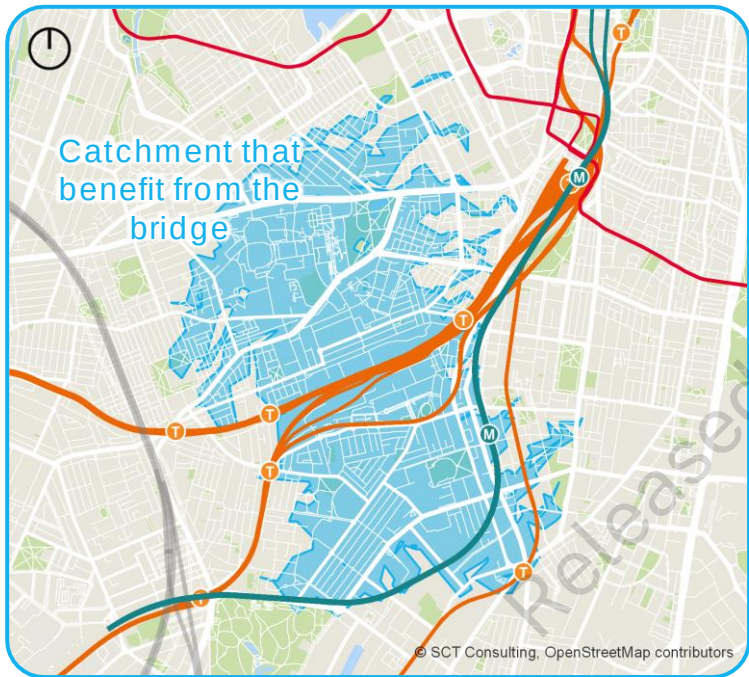
1. Who would benefit from the bridge?
 - Spatial catchment analysis
2. What quantum of people are likely to use the bridge?
 - Review of existing travel patterns (analysis of mobile phone data)
 - Confidence in data
 - Expected users of the bridge
3. How integral is the Redfern-North Eveleigh development to improving use of the bridge?
 - Potential increase in users of the bridge based on changes in land-use

Executive summary



Catchment analysis

Determine who benefits from the bridge compared to the existing scenario and future scenario (with Redfern Station southern concourse).



Travel time saving

An estimate of the average travel time benefits for a customer using the bridge (compared to other alternative corridor crossings).

Average travel time saving

3 minutes

per cross-corridor journey.

Executive summary

Current demand

Who may use the bridge based on existing travel patterns?

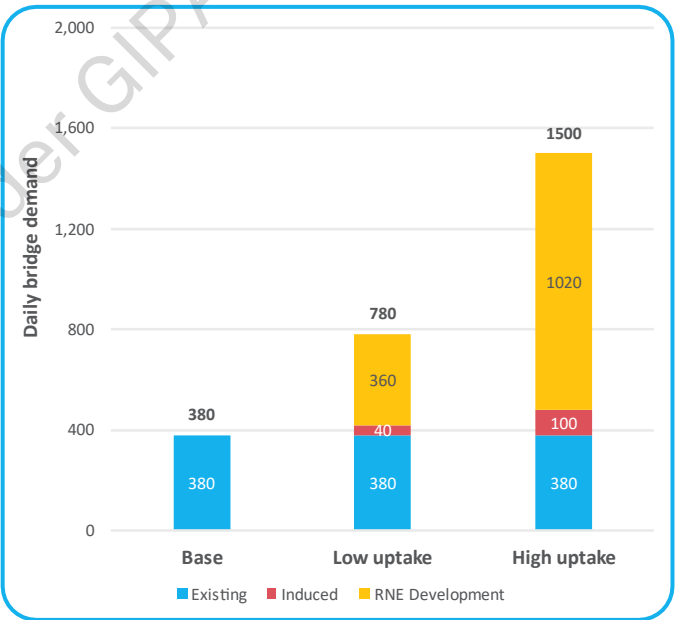


340-420 journeys per weekday

Future demand

Increase in customers due to:

- Provision of the bridge (induced trips)
- Development of Redfern North Eveleigh Precinct



Productivity

The cumulative benefit of the bridge.

19-75 people-hours saved

per typical weekday.

[01]

Who would benefit from the
bridge?

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Existing rail corridor crossings



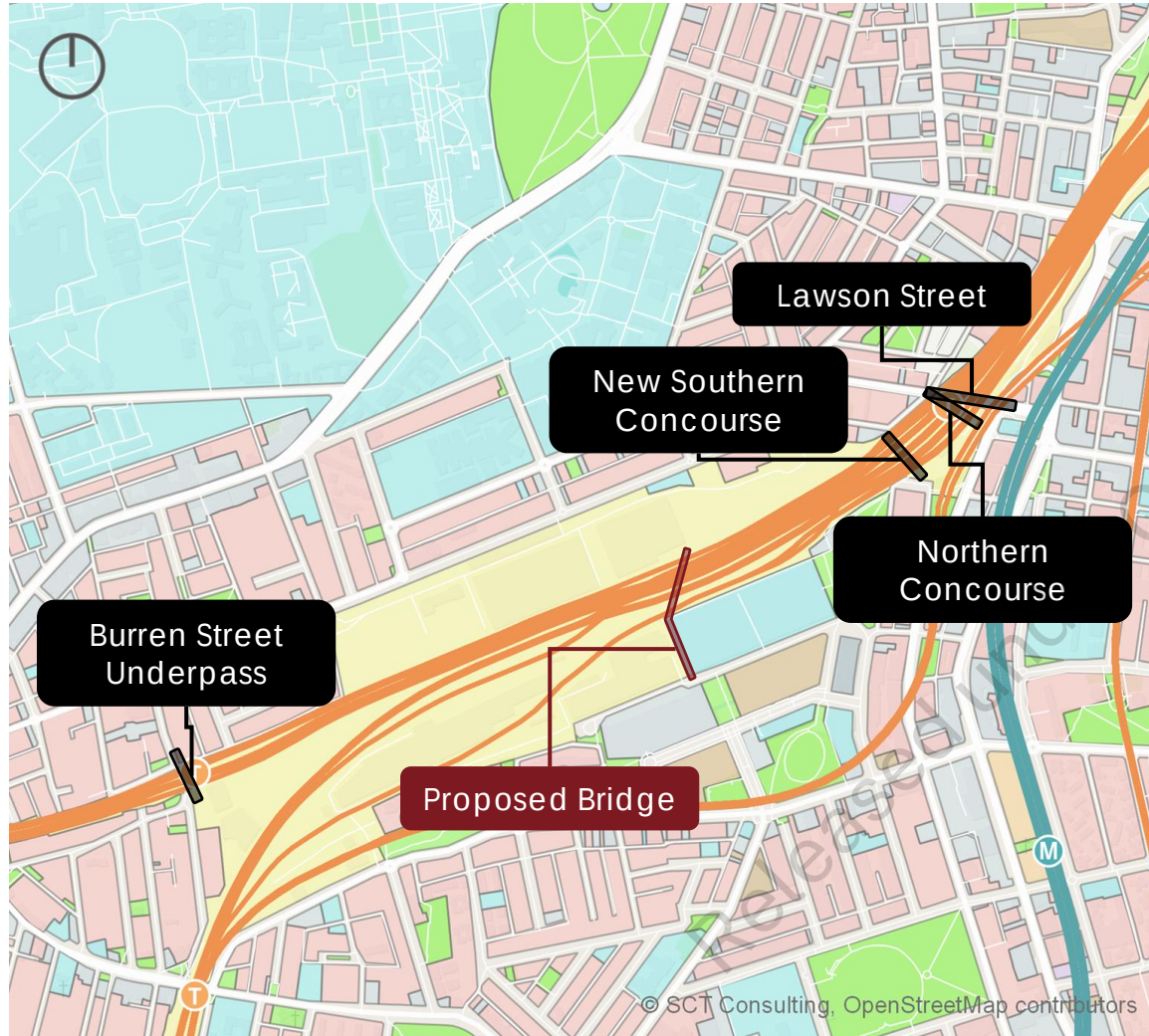
All existing crossings included in analysis.

- Travel time for each route is calculated based on a typical walk speed of 1.35 metres per second
- Additional travel time has been added for:
 - Vertical transport (including stairs or lifts)
 - Road crossings (penalty by type: signalised, zebra and uncontrolled).

Example Extract:
Redfern Station concourses (existing northern and new southern).

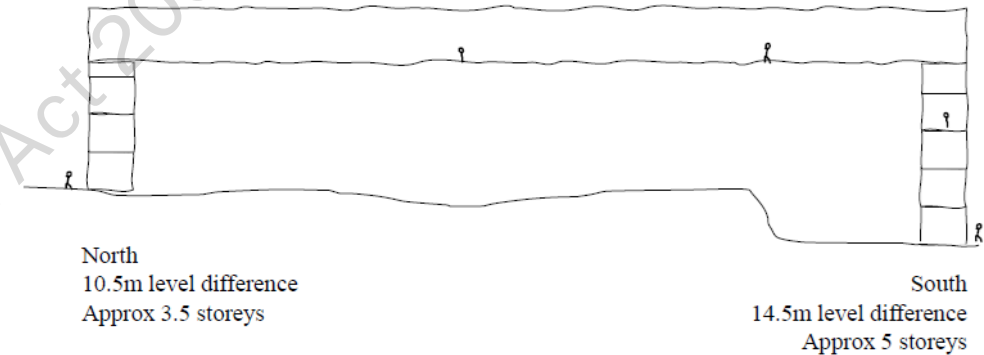


Proposed rail corridor crossing



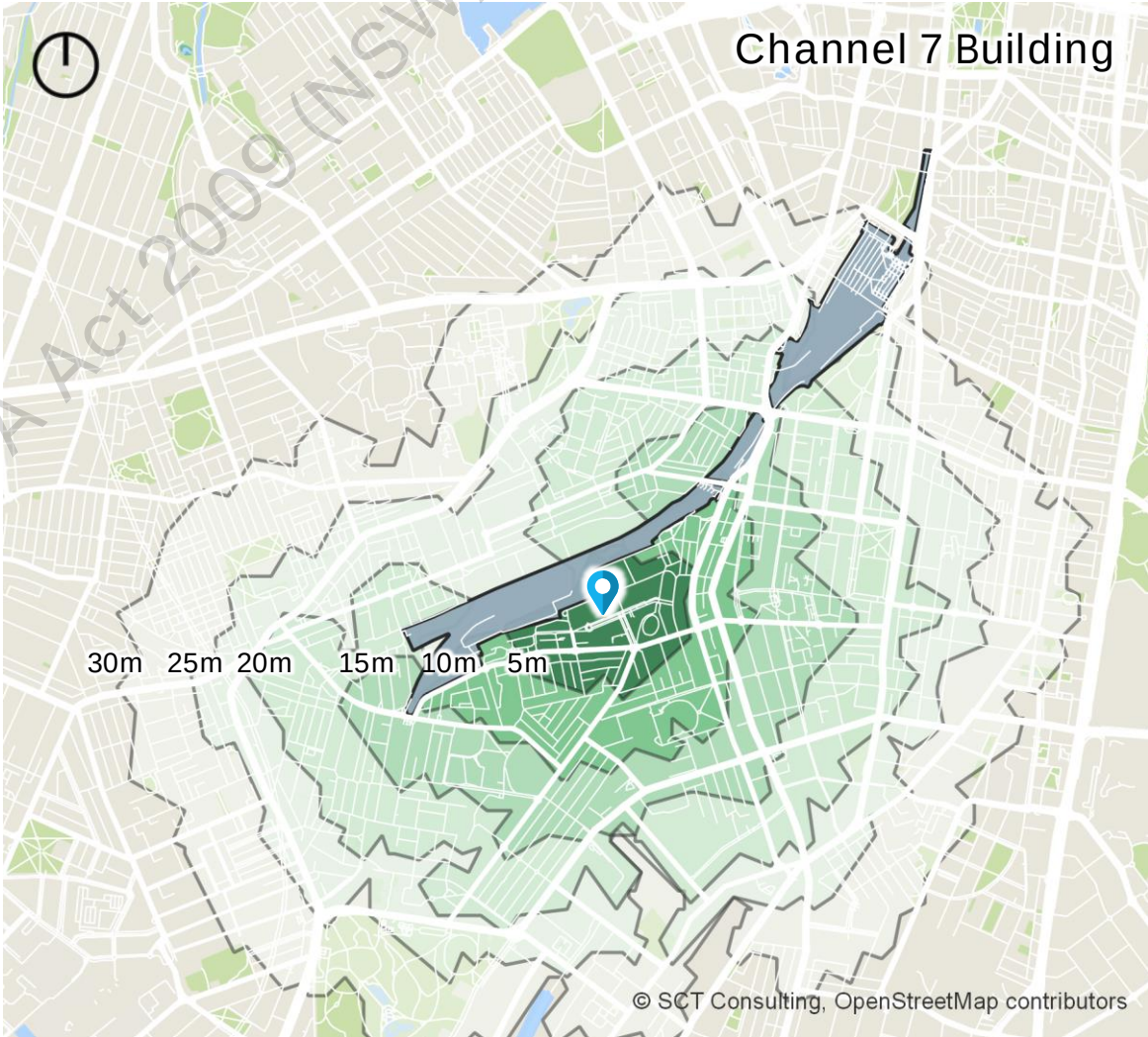
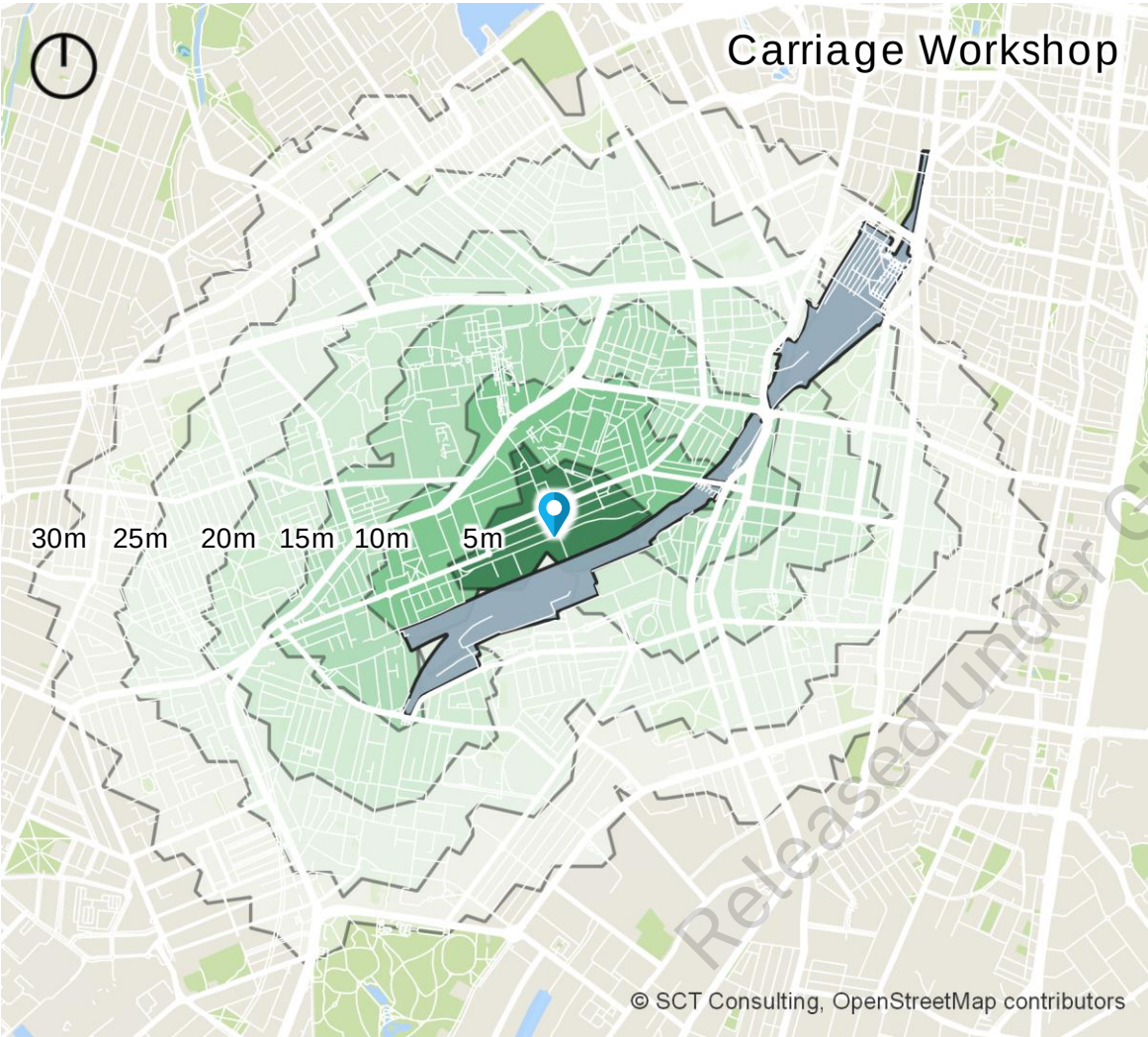
Proposed bridge included in assessment. Based on Arup (November 2022) design pack, the following characteristics have been included:

- Bridge connecting North and South Eveleigh
- Lift access is provided on both ends, based on indicative heights:

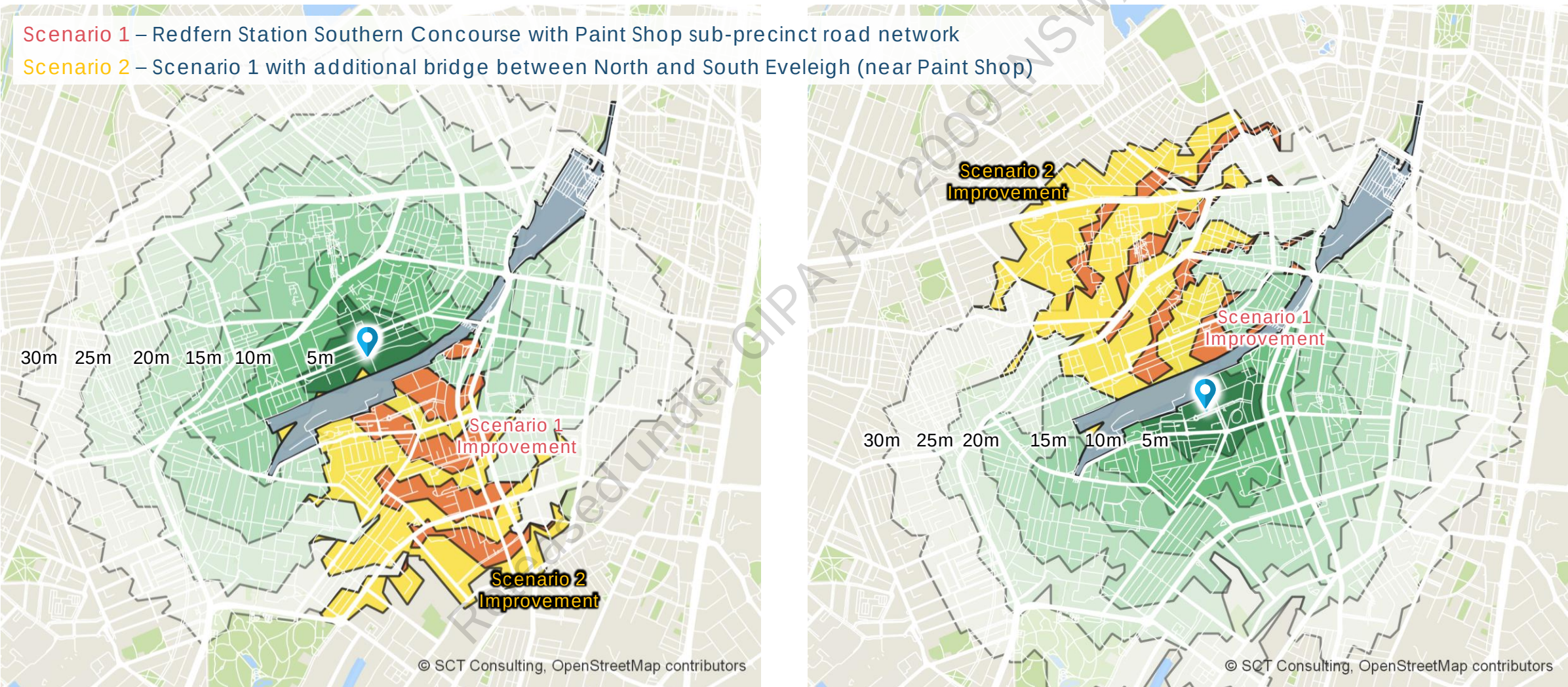


- Due to the height of the bridge, it is unlikely users would utilise the stairs as the main form of vertical transport (unless they opt to do so from a hedonic perspective i.e. for exercise).
- Therefore the travel time of the bridge has been based on a first-principles lift travel time assessment.
- With two lifts at each end, the average trip time (including wait and travel time) is estimated at 33 seconds (north) and 39 seconds (south).
- Including the lifts and extended deck (over the maintenance facility) on the southern end to Locomotive Street, the total crossing time is approximately 4 minutes.

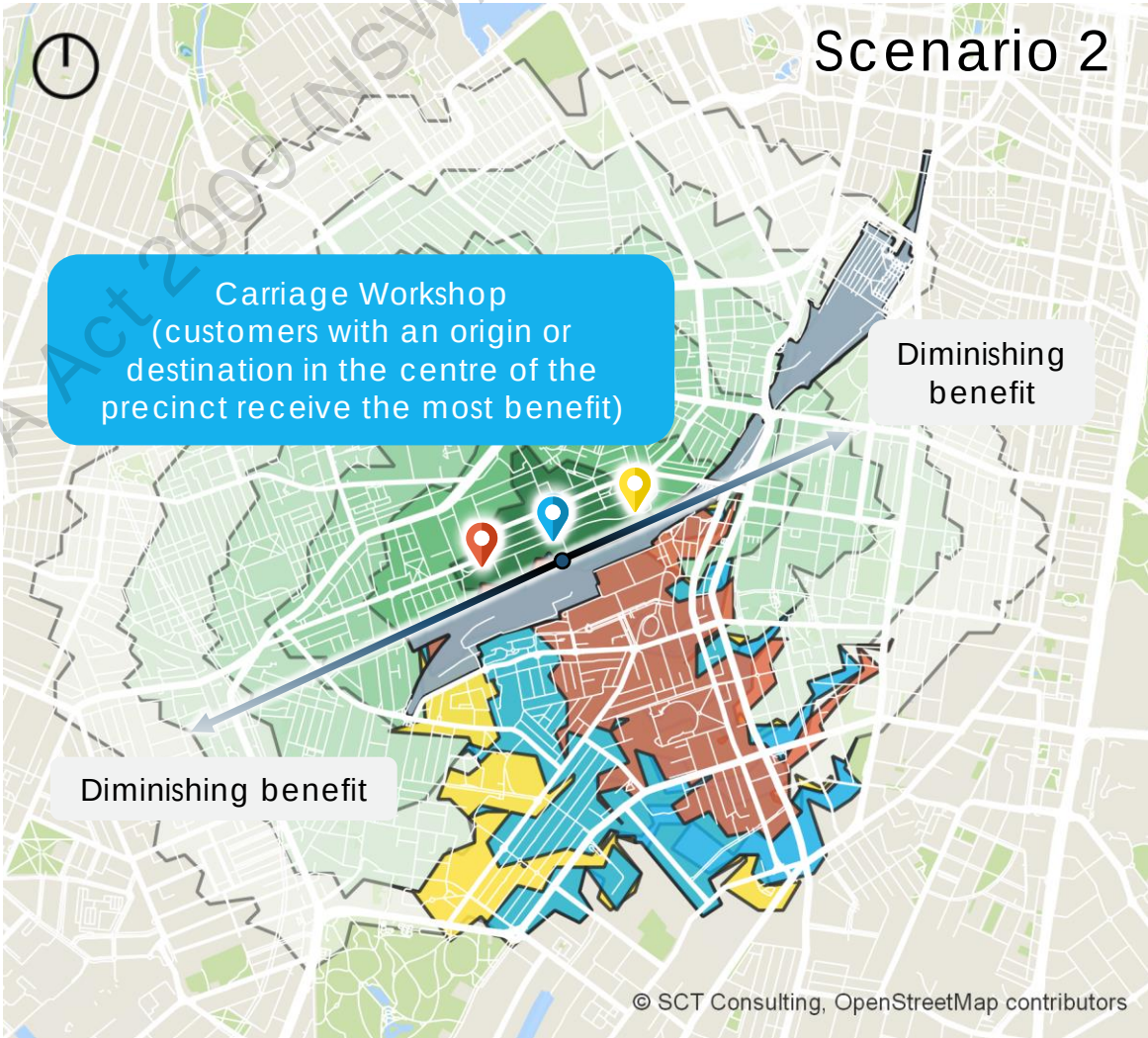
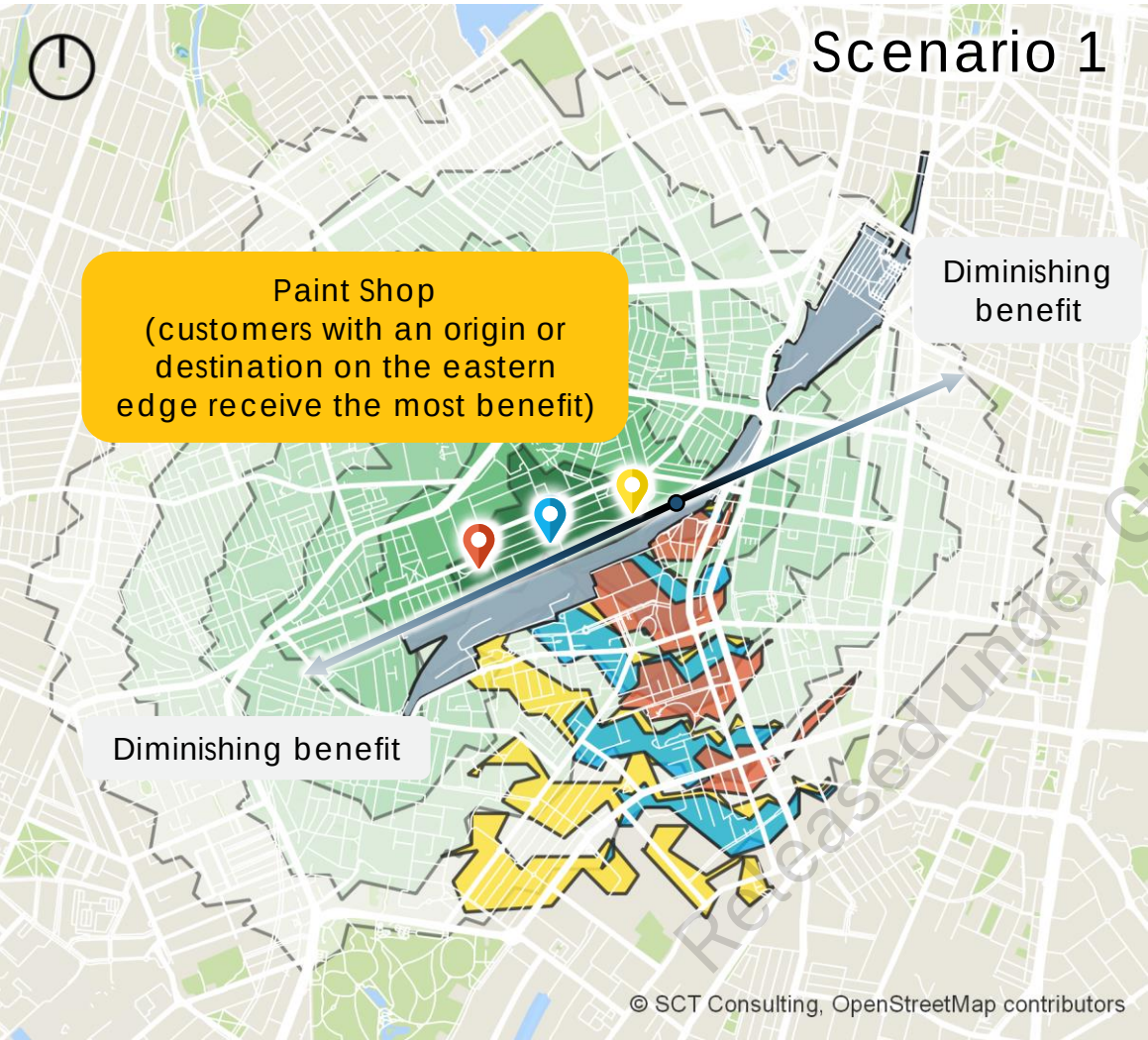
Existing 30-minute walking catchments



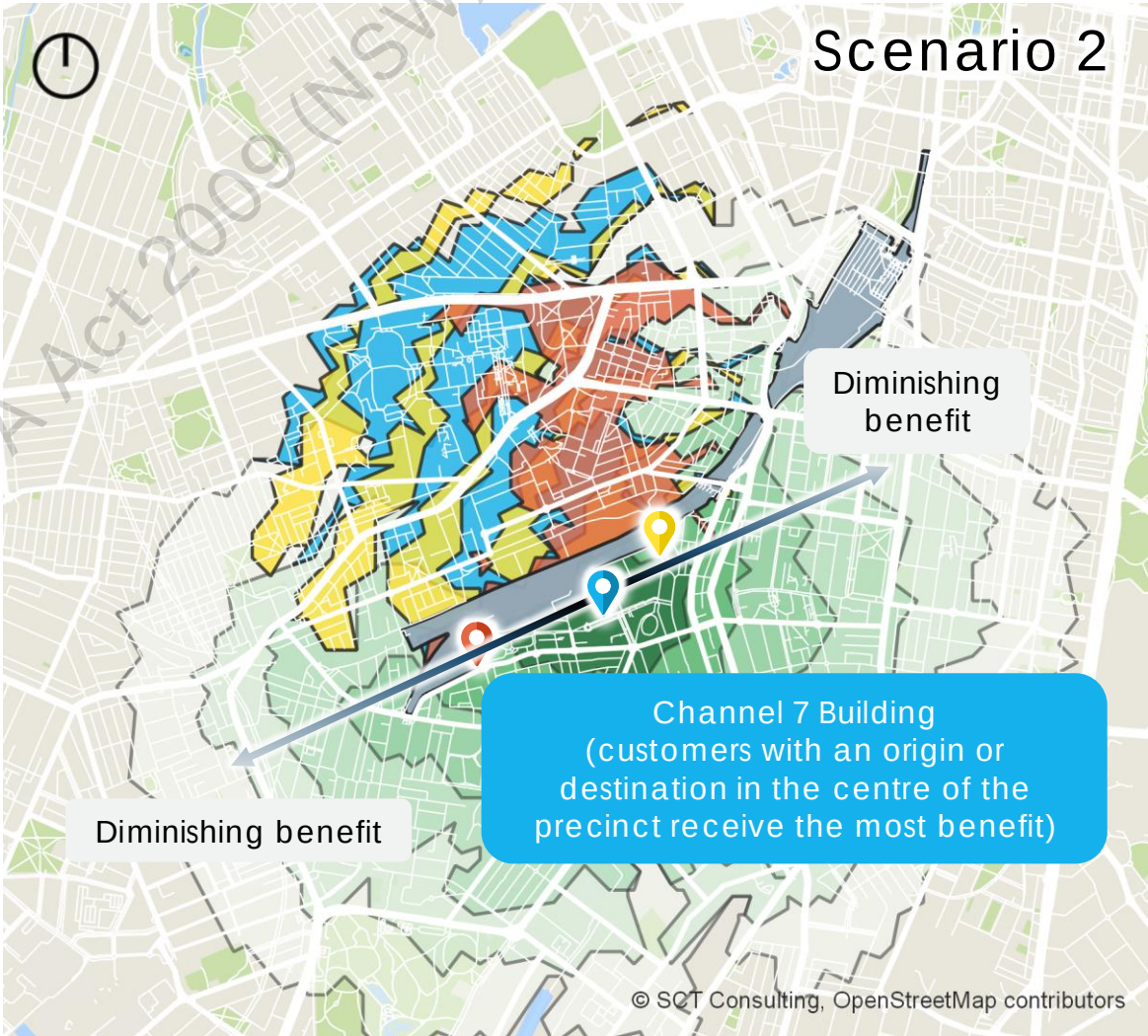
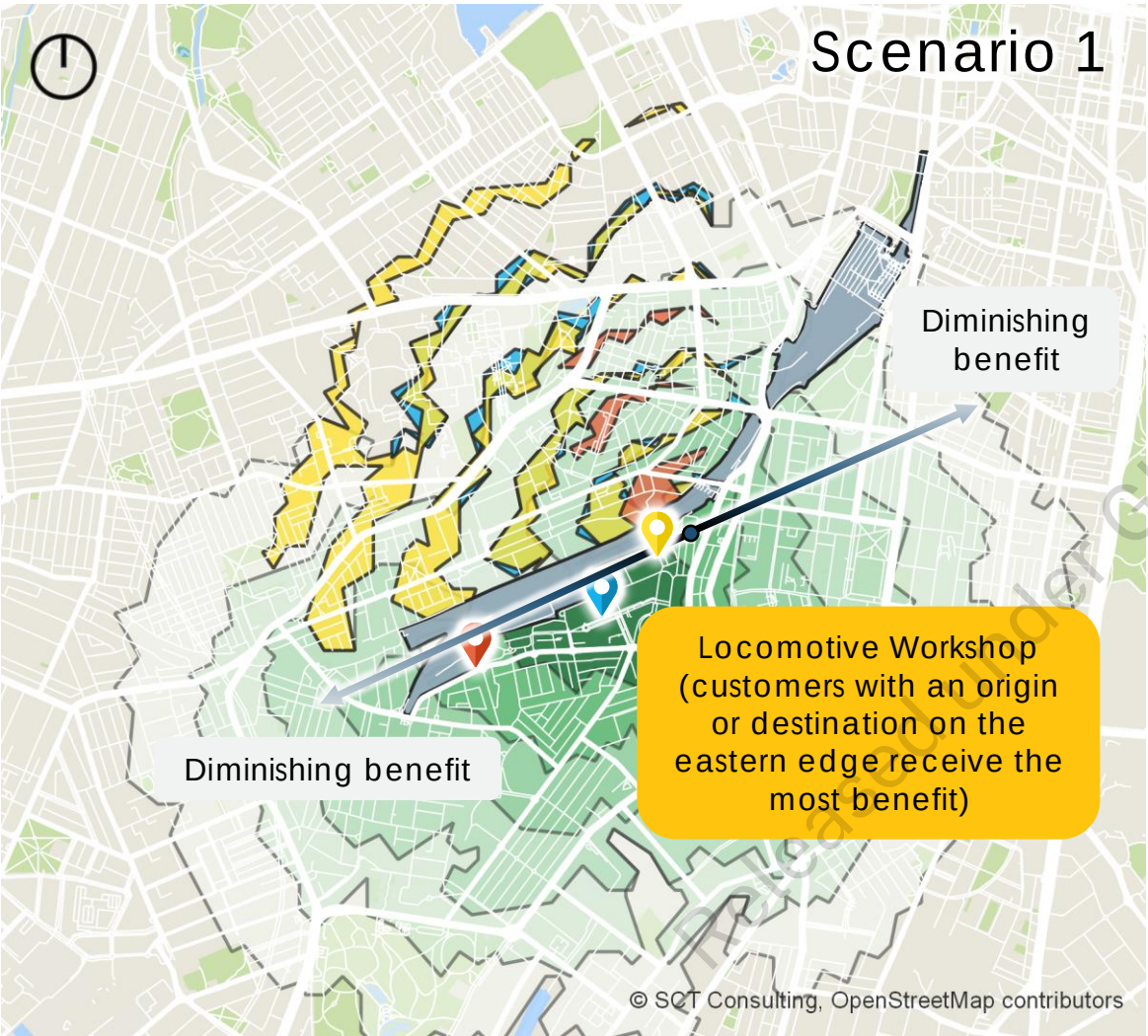
Improvements to 30-minute walking catchments



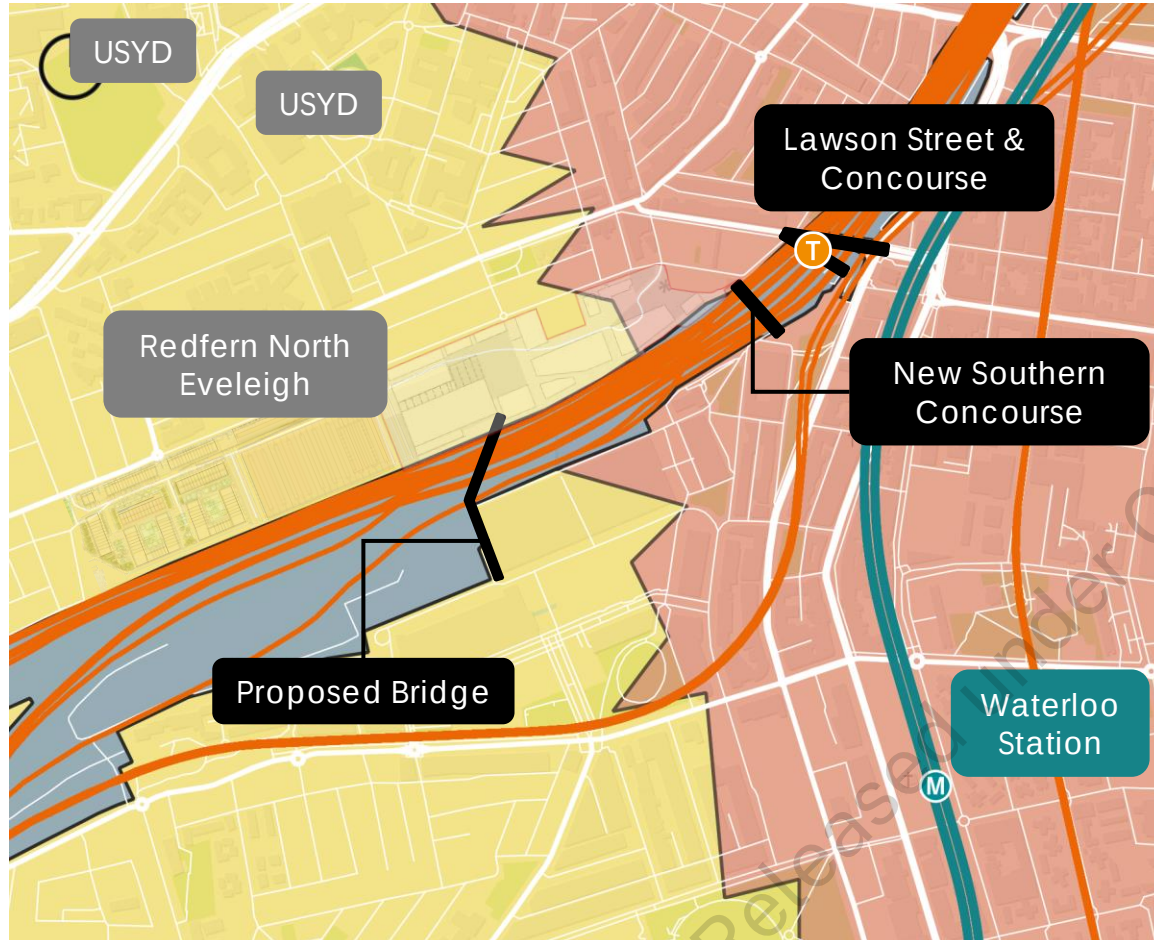
Northern Sites – Improvements by location



Southern Sites – Improvements by location



Southern Concourse versus Proposed bridge



Scenario 1 – Redfern Station Existing and Southern Concourse

Scenario 2 – Proposed bridge between North and South Eveleigh

A comparison of the two alternative groups of crossing options, resulted in the following observations of cross-corridor journeys:

- Bridge connecting North and South Eveleigh is the most attractive (from a travel time perspective) for majority of the RNE precinct.
- The New Southern Concourse is more attractive for access to the commercial developments on the eastern end of RNE.
- Customers (in particular students) who may travel between Waterloo Station (Sydney Metro City & Southwest) and the University of Sydney (USYD) Campus may find it more attractive to use the new proposed bridge between the station and campus.
- Other key destinations such as Broadway Shopping Centre, University of Technology Sydney (UTS) are better served by the New Southern Concourse and existing connections to the north.

Scenario 2 benefit – land use

Main beneficiaries of the additional bridge are cross-rail corridor journeys to/from:

- Urban residential
- Public services (University of Sydney)
- Commercial (North and South Eveleigh precincts). Noting RNE precinct is currently listed as infrastructure (railways).
- Light industrial and commercial (Waterloo and Green Square)

Travel time saving (range)

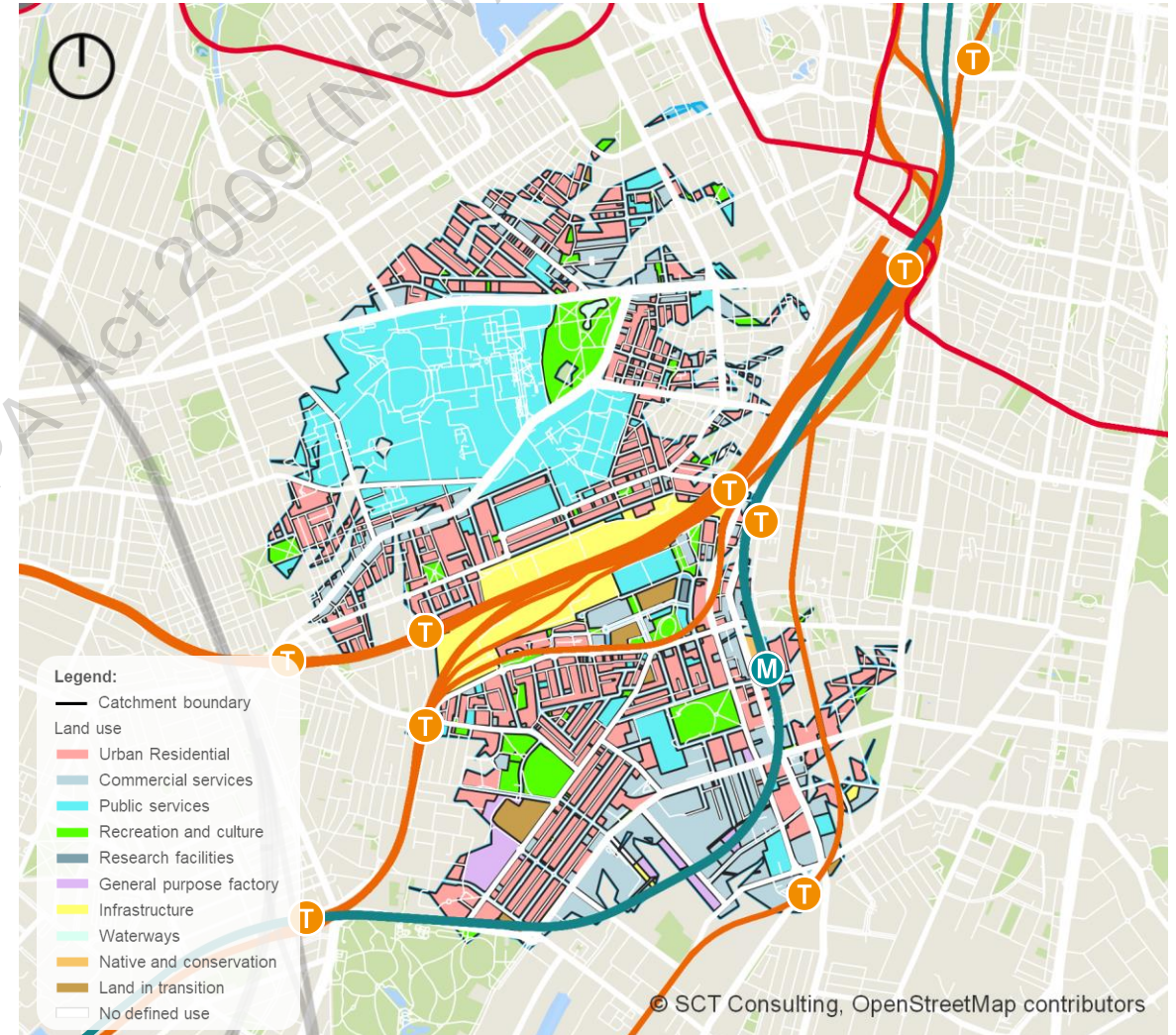
Up to 12 minutes

For cross-corridor journeys in the highlighted regions. For some customers, the benefit may be more; likewise, the benefit may be less for others.

Average of travel-time saving

4 minutes

Weighted average based on forecast population and employment data (2036) across the walking catchment.



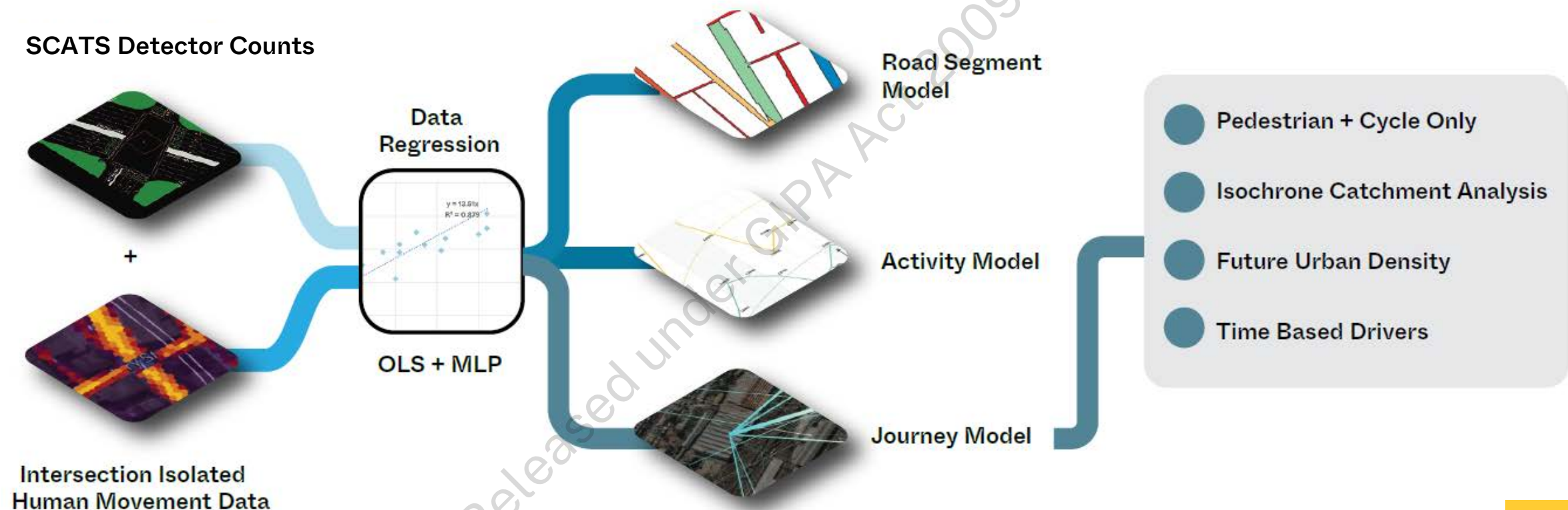
[02]

What quantum of people are likely
to use the bridge?

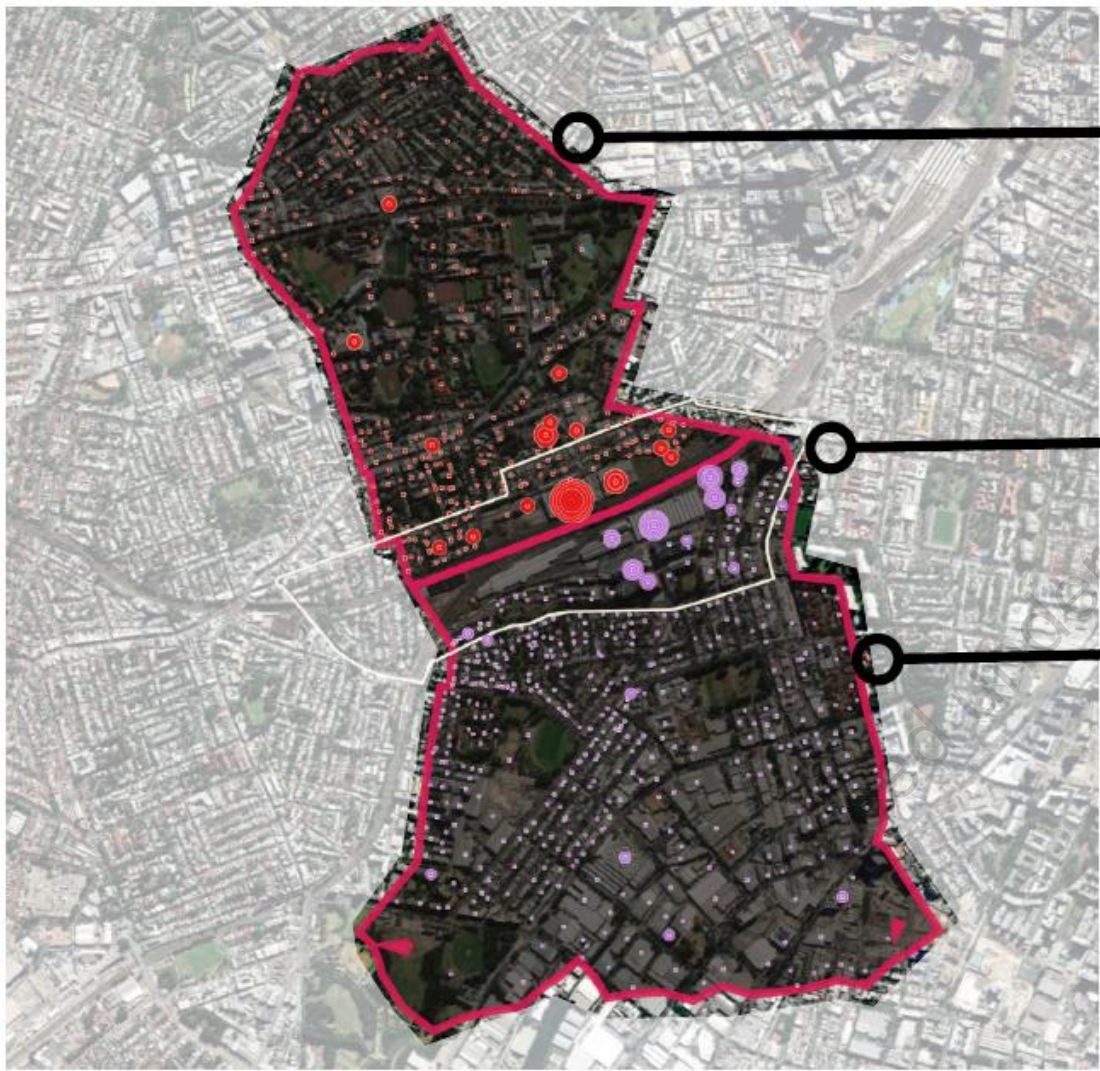
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Bridge demand analysis - process

We used a number of data processing methods to predict the number of journeys per hour that would use the proposed bridge.



Current observed cross-corridor origins and destinations

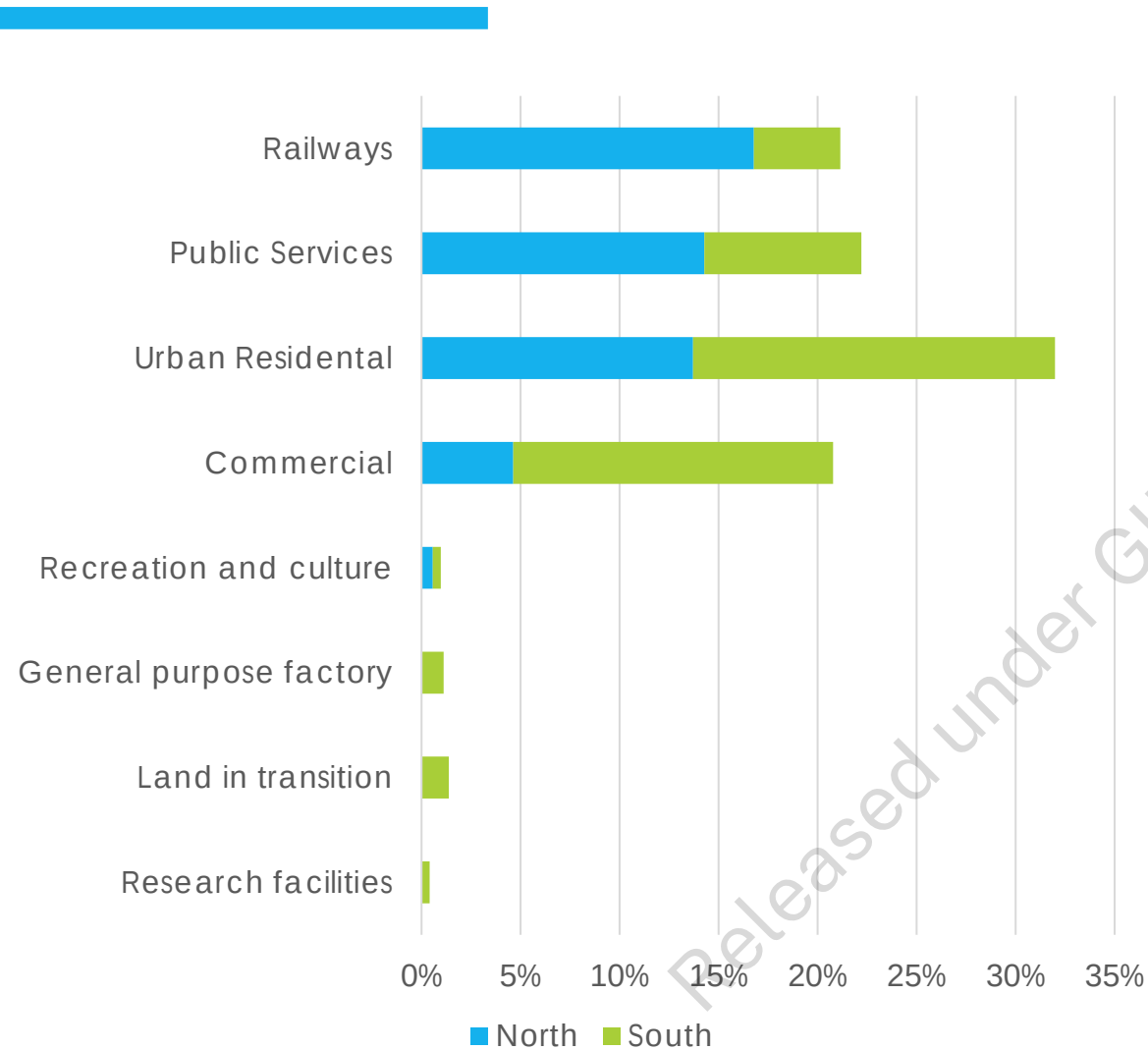


North
Primary Generator: **University of Sydney**

Precinct Boundary
Percent of Total Journeys: **26%**
(Excludes Redfern Station activity)

South
Primary Generator: **Urban Residential**

Cross-corridor trips by land-use



(Excludes Redfern Station activity – some areas around corridor including RNE precinct are classified as Railways)

Journey origins

(the reciprocal can be assumed for a return journey)

32%

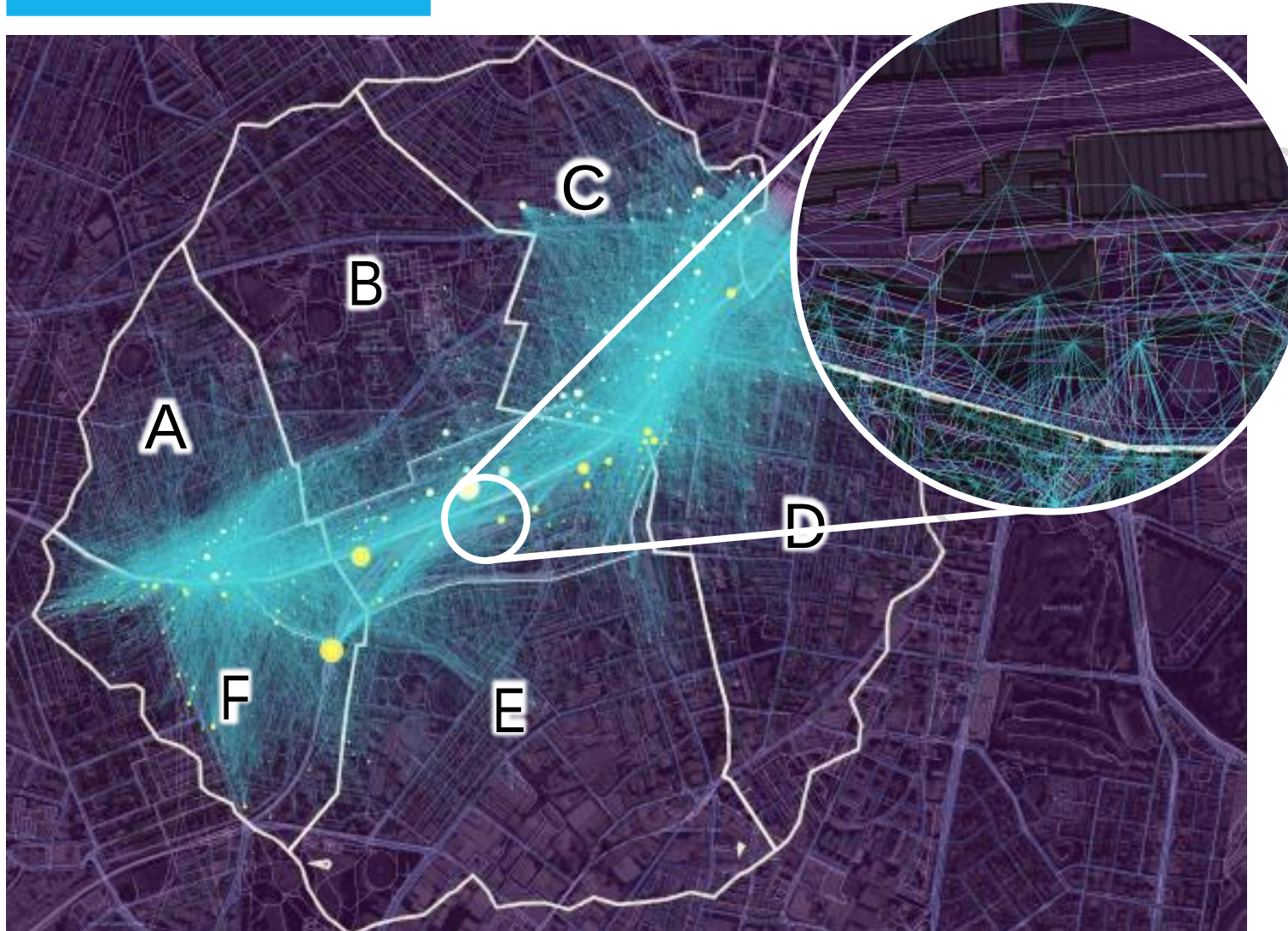
Journeys originate from residential land-uses

<2%

Journeys originate from land-uses classified as recreation and culture.



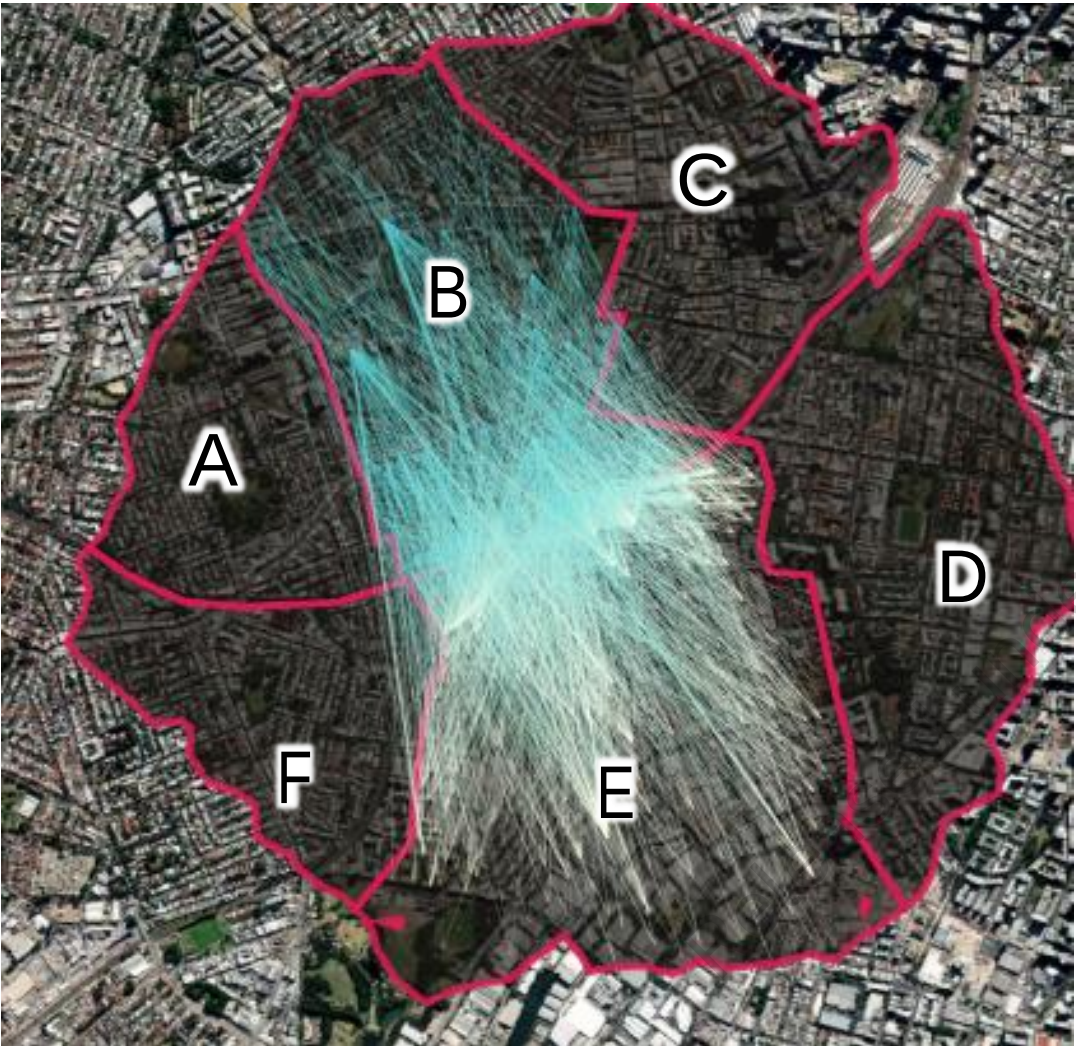
Study area - benefiting regions (and O-D connections)



Catchment analysis indicates greatest benefit to Regions B and E (and travel to and from these locations).

Regions A – F and C – D already have high levels of permeability, which is corroborated by high observed trips.

Current demand for bridge



Validated trips

340-420 journeys per day

R² Average

0.8875

Typical walking characteristics

53% less than 1000m in length

Peaks:

8:15-9:15 AM

4:45-5:45 PM



About the model:

Model Size: 152,470 Journeys

Number of Buildings: 1,391

Time Interval: 15 minutes

Time Series: Weekdays Only

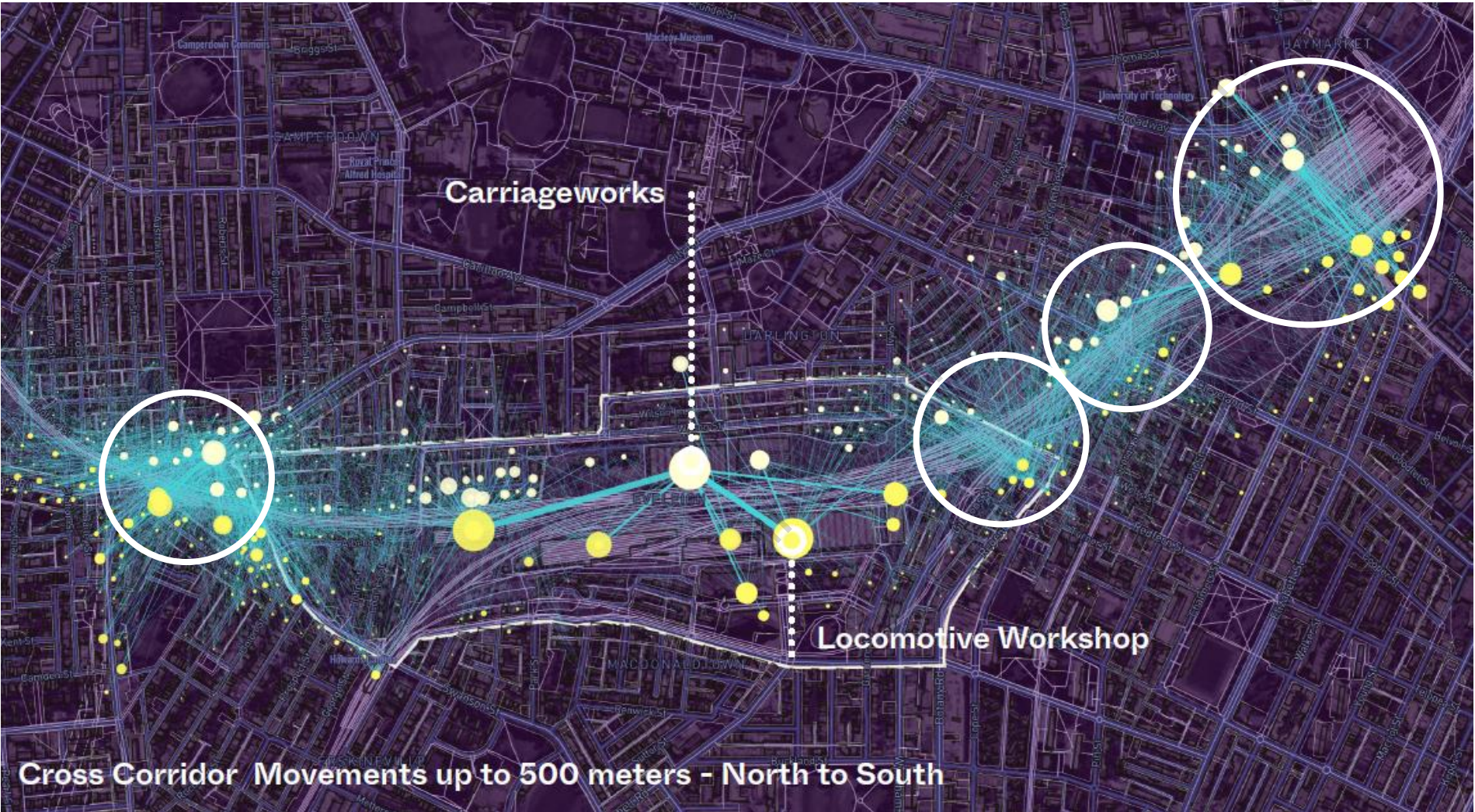
Mode: Non-Vehicle

[03]

Role of Redfern-North Eveleigh development?

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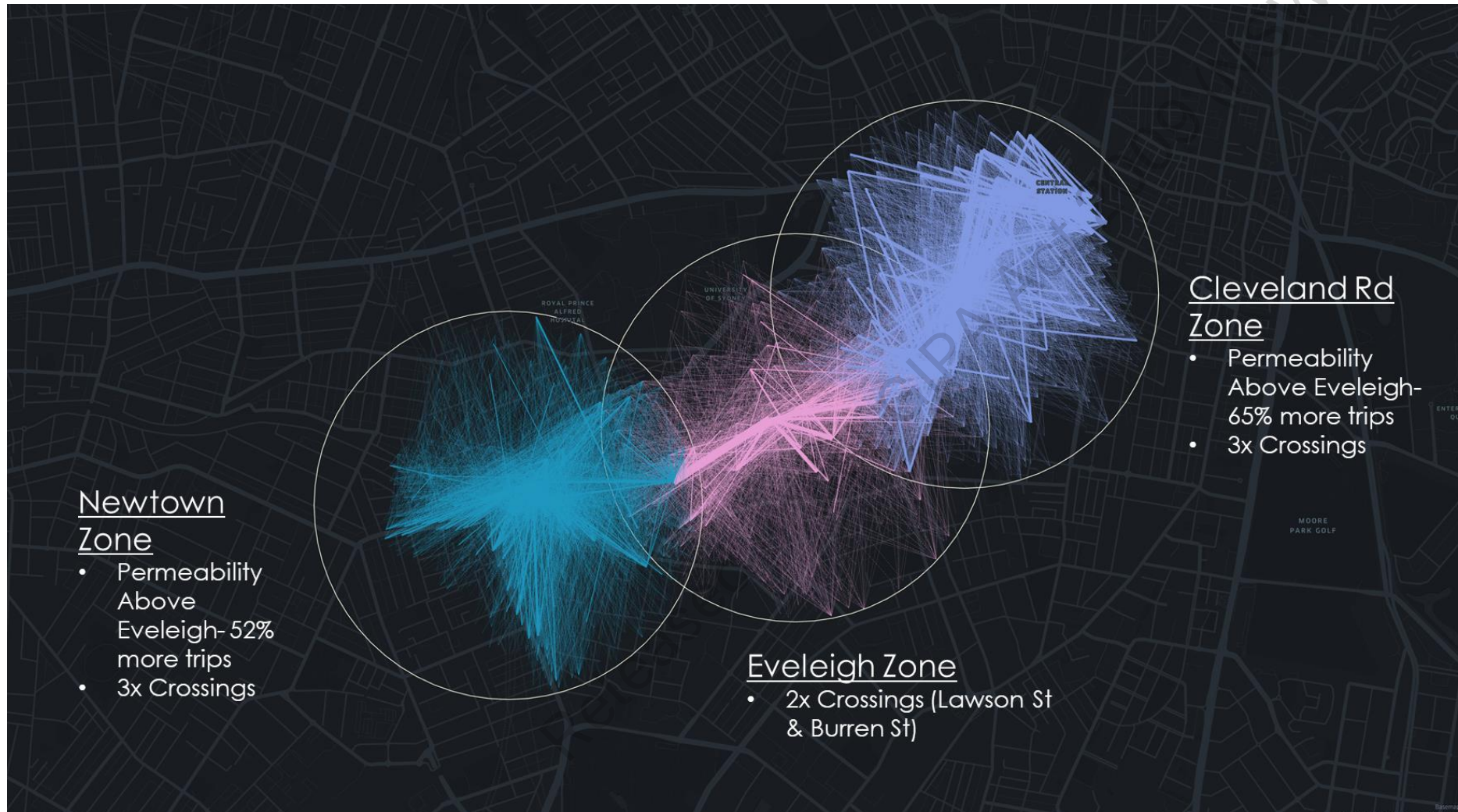
Increased activity due to attractions



Observed activity due to generators and attractions either side of the rail corridor (with a nearby crossing).



Increased activity due to attractions



Conservative assumption for uptake in activity

+10% to +25%

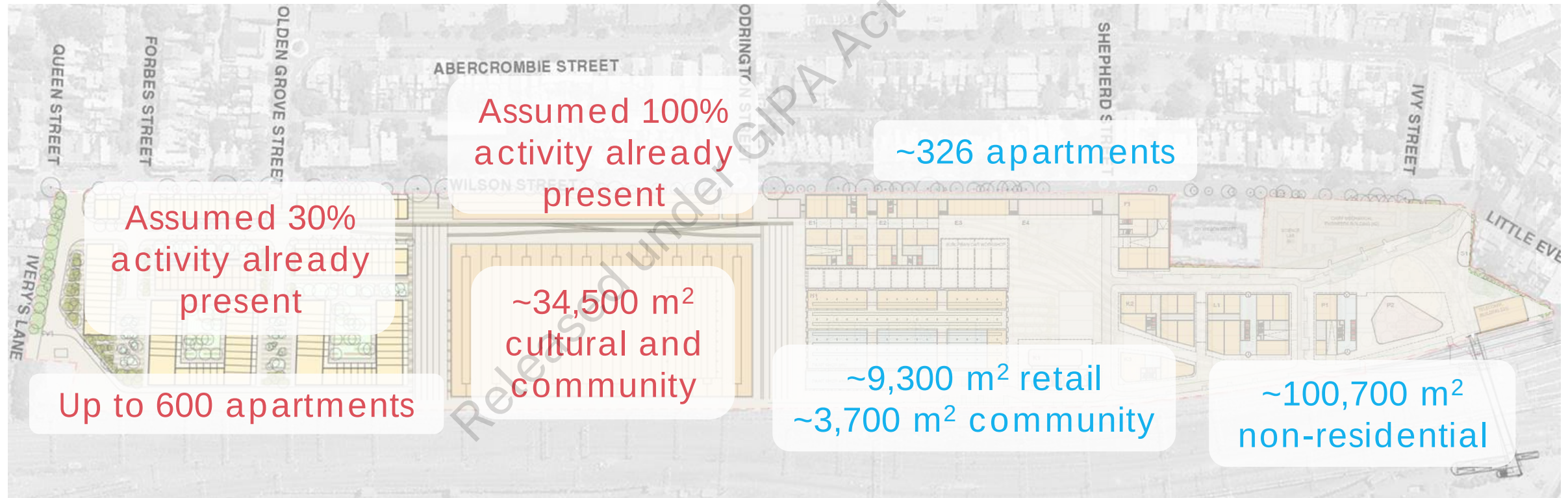
Based on observed activity in adjacent regions.

Increased activity due to land-use uplift

Proportion of Redfern-North Eveleigh precinct will utilise the bridge. Bridge may be used for access to and from the precinct and recreational purposes including lunch breaks to move between attractions at either the north or south precinct.

+10-20% of RNE precinct daily population

(includes customers who would use the bridge multiple times per day – with current 10-20% walk mode share for the precinct)



[04]



Outcomes

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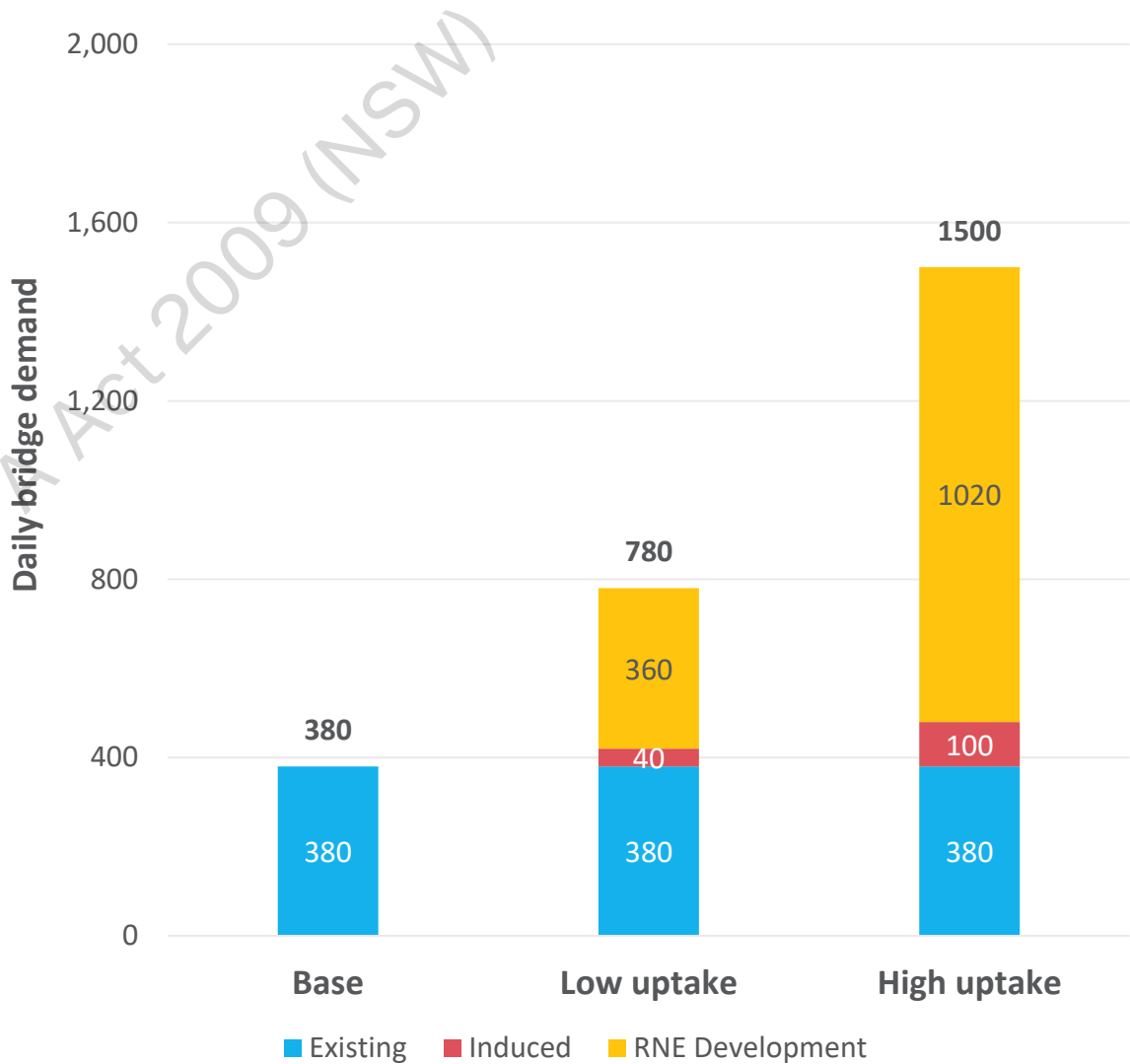
Potential bridge users

Induced demand:

- Increased permeability between generators and attracts
- Lower level of activity either side of rail corridor compared to regions like Newtown

RNE development related demand:

- Single largest contributor to use. Daily count includes an estimate for trips to and from the precinct.
- Assumes the proposed bridge is the most attractive option for:
 - 100% of residential, community and cultural land-uses.
 - 70% of commercial land-use. Some high-density commercial is located on the eastern edge which is closer to the southern concourse, making the proposed bridge less attractive for these customers.
- Assumes precincts are being established as self-serving for residents and employees.
 - If land-uses are linked between RNE and South Eveleigh we would expect more daily trips.

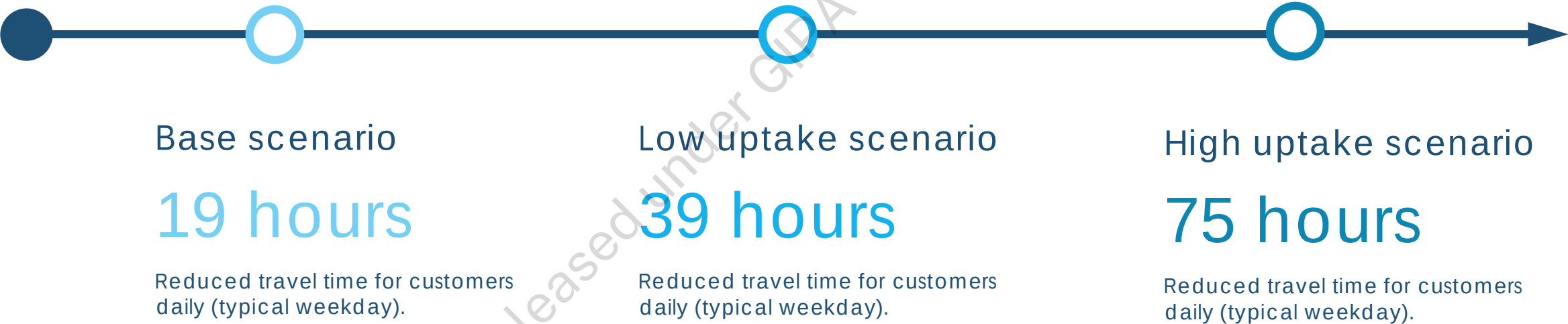


Potential benefit – daily productivity

Average travel time saving

3 minutes

per cross-corridor journey.



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