Every bus stop counts

Using the PTDG and GIS tools to build a network-wide picture in Ōtepoti Dunedin

Pim van den Top

Transportation Group Conference 2024

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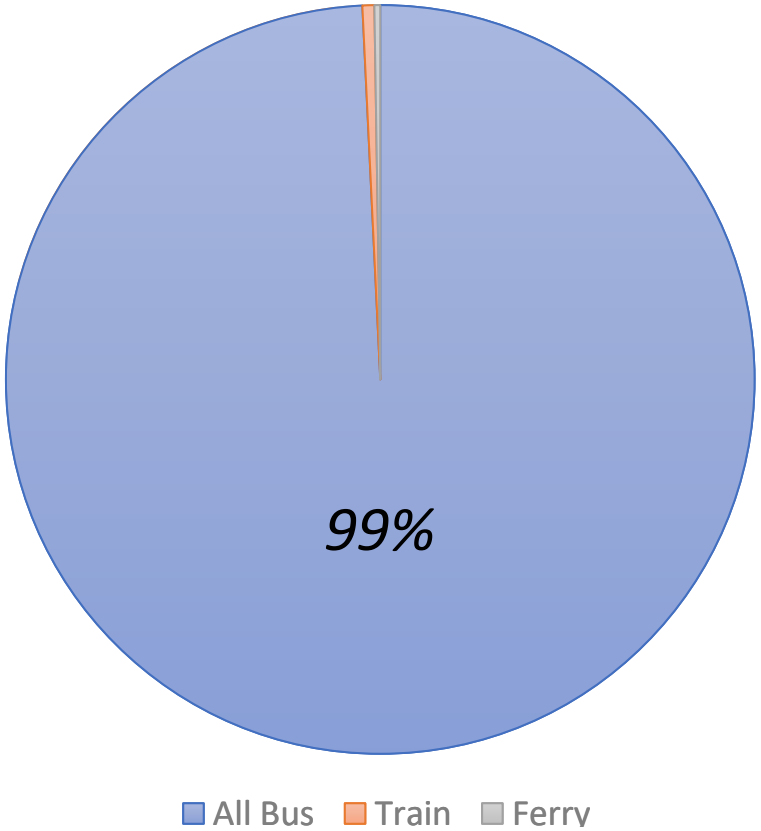
TRANSPORT PLANNING AND DESIGN

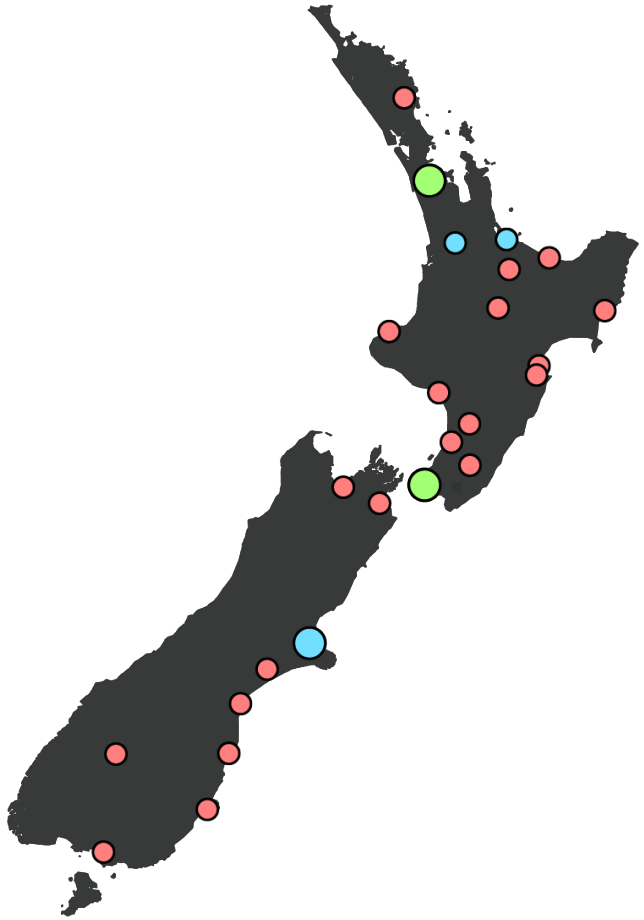
Key things covered

- Buses are the unsung hero of PT and mode shift
- PTDG guidance is great!
- But what is the next step?
- How do we assess our current stops
- How do we collect better data

To achieve mode shift, buses will play big role



NZ – without Auckland and Wellington



City Rail Link v0.1 – 1920s

12

SCHEME ABANDONED.

MORNINGSIDE DEVIATION.

Government's Decision Announced by Minister of Railways.

UNDERTAKING WOULD COST £2,174,570.

NO SAVING IN GOODS HAULAGE.

Because of engineering difficulties, the high cost of electrification, the fact that there would be no substantial saving in goods haulage, and the unpromising future of suburban railway transport, the Government has decided to abandon the Morning-

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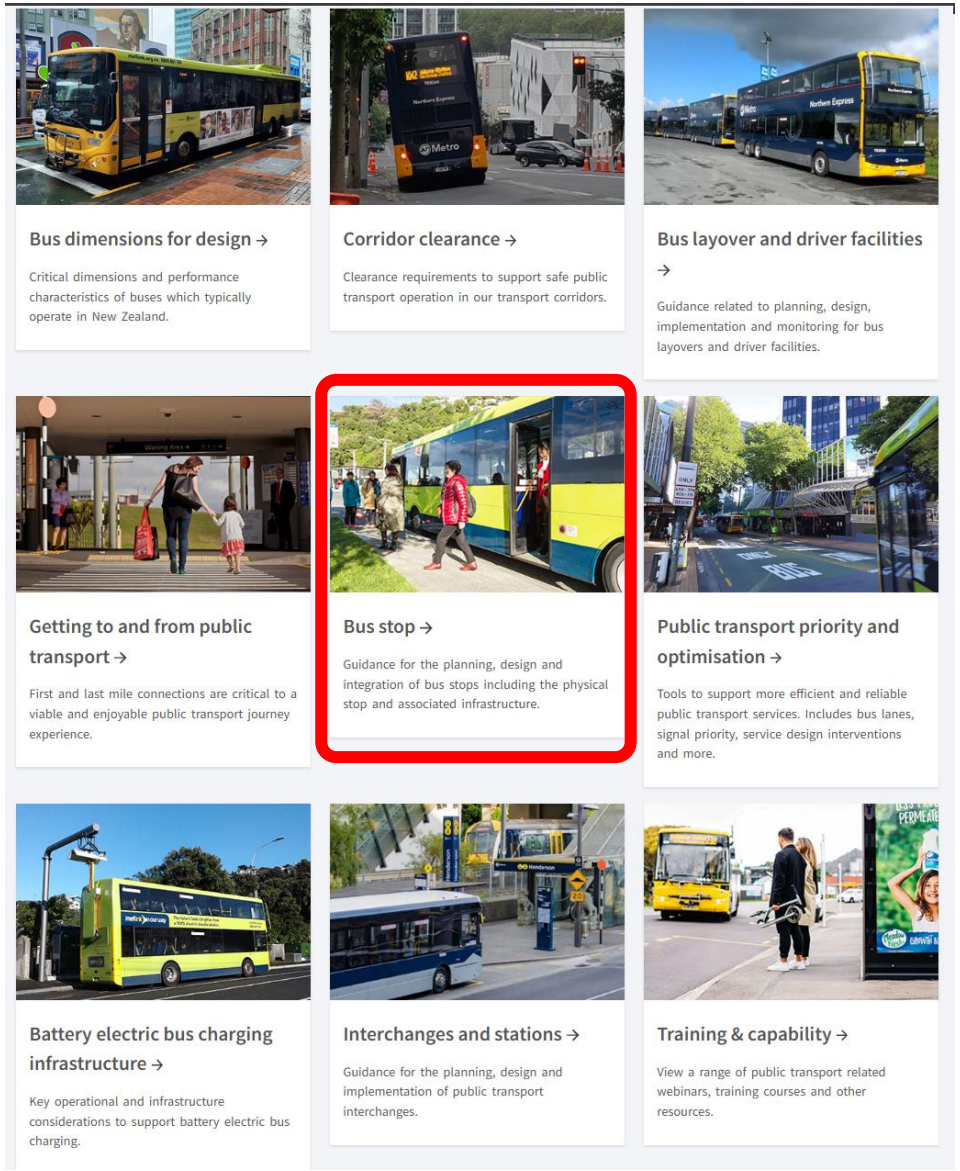
And it all starts with… The mighty bus stop!

PTDG guidance – released starting 2020

- Great resource, offering a nationally consistent base for all PT planning and design
- Bus stop section offers great guidance on bus stops
- How can we use it with existing stops?
- What about a whole network of stops?



PTDG guidance – stop classification

5 bus stop classifications:

- Public transport interchange
- Premium
- Intermediate
- Standard
- Basic

ONF Place scale	Indicative land use or sense of place	ONF public transport descriptor*	Passenger volume at stop†	Bus stop classification
P1	Very high density mixed-use (high-rise apartments and office towers), downtown retail and commercial centres, civic spaces, shared spaces, downtown precincts and waterfronts.	Dedicated (PT1), spine (PT2), (and regional services)	High	Public transport interchange or premium
			Moderate	Premium or intermediate
P2	Diverse mixed use, low-rise apartments, special zones, high-density commercial/retail and main street promenades.	Dedicated (PT1), spine (PT2), primary (PT3) (and possibly inter-regional services)	High	Premium or intermediate
			Moderate	Intermediate
P3	Medium-density and mixed-use residential/commercial, villages, urban greens and stopping places.	Spine (PT2), primary (PT3), targeted (PT5)	High	Intermediate
			Moderate	Intermediate
			Low	Standard
P4	Mostly low/medium density residential neighbourhoods in urban and peri-urban areas. Lifestyle blocks in peri-urban areas.	Secondary (PT4), targeted (PT5)	Moderate	Intermediate
			Low	Standard
P5	Mostly rural, except for motorways and expressways in urban areas	Targeted (PT5)	Low	Basic

PTDG guidance – bus stop components

Stop classification →	Public transport interchange	Premium	Intermediate	Standard	Basic
Accessibility					
Recommended minimum kerb height at front door (& ideally rear door): 150mm for normal kerb, 160mm for accessible kerb*	Essential	Essential	Essential	Recommended	Optional

Bus stop component

Component requirement

PTDG guidance – bus stop components

	Public transport Interchange
Accessibility	
Recommended minimum kerb height at front door (& ideally rear door): 150mm for normal kerb, 160mm for accessible kerb*	Essential
Paved clear stand area (hardstand)	Essential
Tactile ground surface indicators	Essential
Connecting footpath to/from bus stop	Essential
Crossing facility close to bus stop	Essential
Signs and road markings	
Bus stop sign (R6-71 or R6-71.1) †	Essential
Bus box road marking (M3-2 or M3-2A)†	Essential
'Bus Stop' text road marking (M3-2 or M3-2A)†	Essential
'No Stopping' road marking	Essential
Coloured surface treatment	Optional
Safety and security	
Street lighting	Essential
Shelter with lighting	Essential
Emergency help point	Essential
CCTV cameras	Recommended

Street furniture	
Seating	Essential
Shelter‡	Essential
Rubbish bin	Essential
Recycling bin	Recommended
Ticket sales/top-up services (machine or counter)	Essential
Cycle parking	Essential
Stop-specific information	
Bus stop flag	Essential
Stop number	Essential
Direction of travel	Essential
Site-specific fare information	Essential
Stop-specific timetable (departure times)	Essential
Stop-specific route diagrams	Essential
Information telephone number or web address	Essential
Stop name	Essential
Wider area fare information & zone map	Essential
Wider area route map	Essential
Real-time information signs	Essential
Enhancements	
Landscaping	Recommended
Public art	Recommended
Community notice board	Recommended
Vending machine	Recommended

PTDG guidance – bus stop components

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Coloured surface treatment	Optional	Optional	Optional	Optional	Optional
Safety and security					
Street lighting	Essential	Essential	Essential	Recommended	Optional
Shelter with lighting	Essential	Essential	Essential	Recommended	Optional
Emergency help point	Essential	Recommended	Recommended	Optional	Optional
CCTV cameras	Recommended	Recommended	Recommended	Optional	Optional

Street furniture					
Seating	Essential	Essential	Recommended	Recommended	Recommended
Shelter‡	Essential	Essential	Essential	Recommended	Recommended
Rubbish bin	Essential	Essential	Recommended	Recommended	Optional
Recycling bin	Recommended	Optional	Optional	Optional	Optional
Ticket sales/top-up services (machine or counter)	Essential	Recommended	Recommended	Optional	Optional
Cycle parking	Essential	Recommended	Recommended	Recommended	Optional
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Landscaping	Recommended	Recommended	Optional	Optional	Optional
Public art	Recommended	Recommended	Optional	Optional	Optional
Community notice board	Recommended	Recommended	Optional	Optional	Optional
Vending machine	Recommended	Recommended	Optional	Optional	Optional

A few key challenges

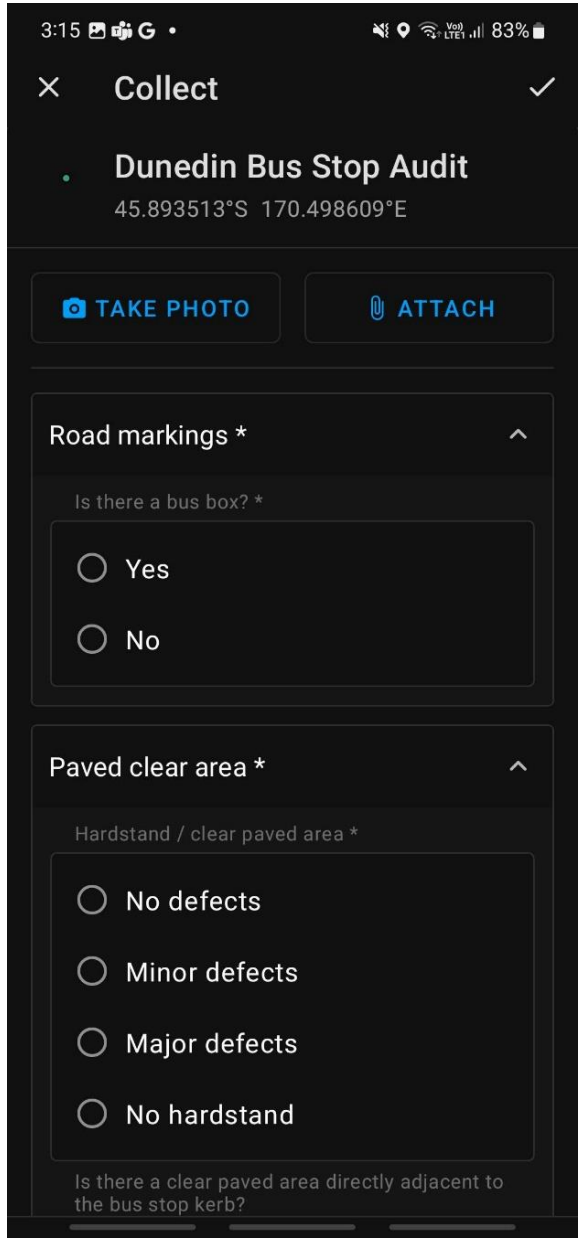
- Data – availability and usefulness
- Scale – 800 stops x 35 components = 28,000 things to measure (Dunedin)
  - For comparison, Nelson has ~200 x 35 = 7,000
  - Auckland has ~6,000 x 35 = 210,000
- Local context
  - Some councils only have 1 or 2 bus stop types
  - Priorities may differ from guidance

Data and scale

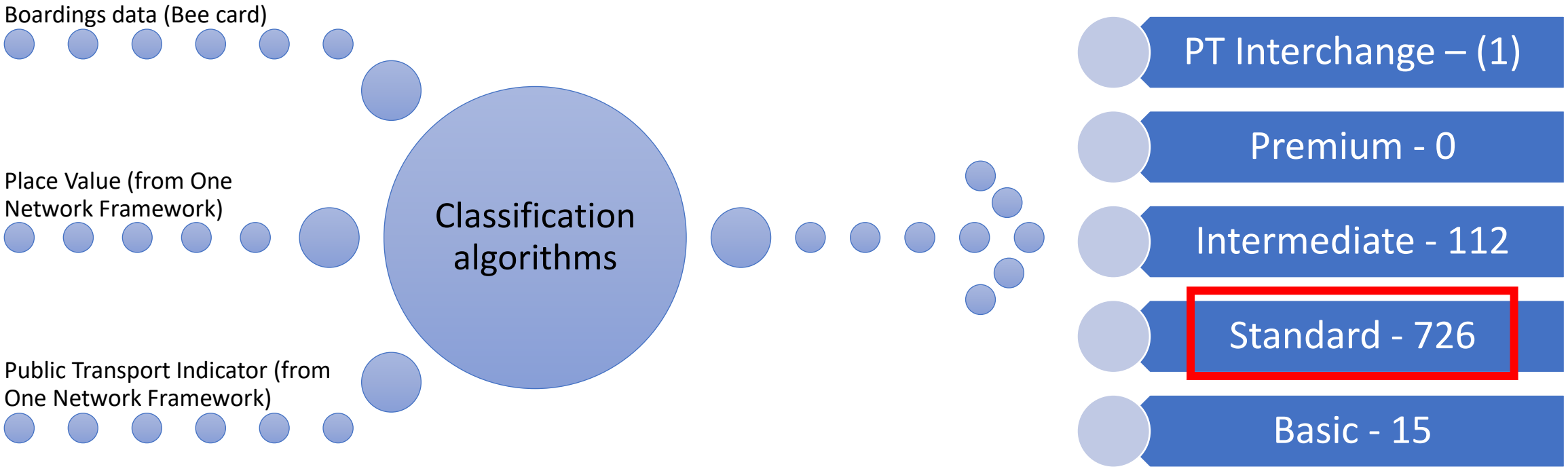
- Worked with the client to select most important and relevant bus stop components
- Decision on what aspects of a component to capture – presence? Quality? Type? Etc.
- What data is already available?

Data collection process

- ArcGIS FieldMaps
  - Simple interface
  - Preloaded and locked fields, depending on previous answers
- No expertise required, just some basic training
- Data goes straight to the cloud
- Photos so that data can be checked and updated later, or to provide further context



Stop classification



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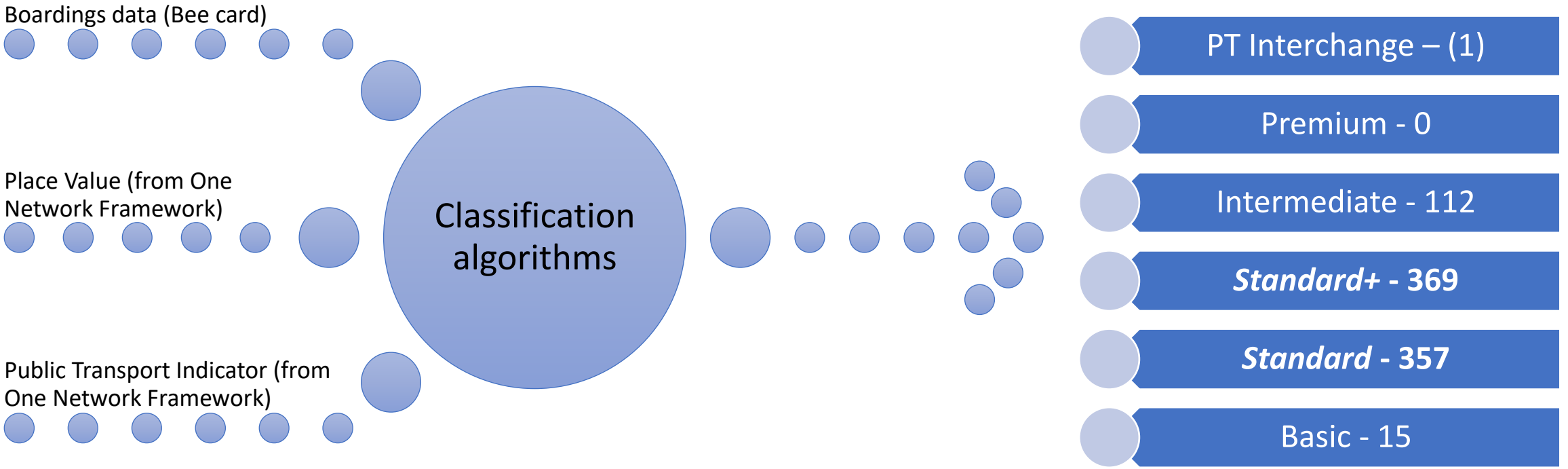
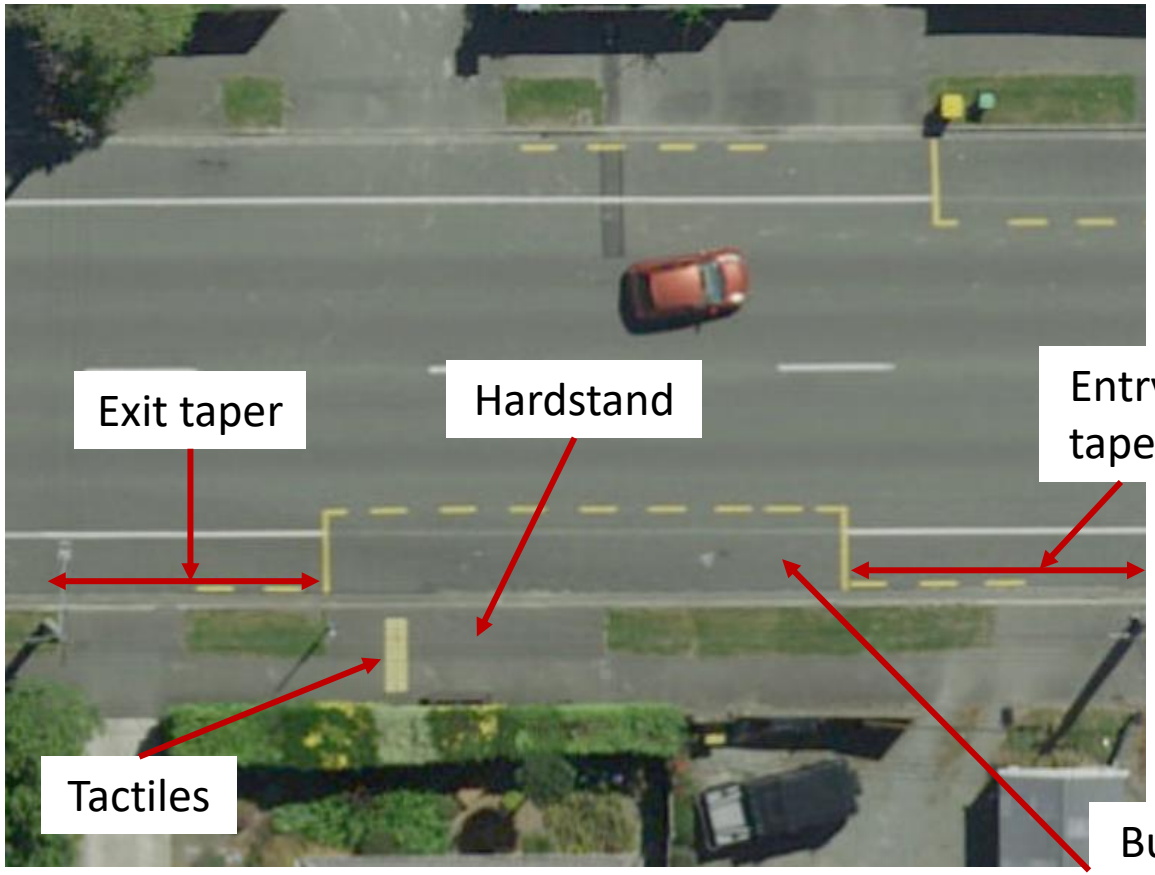


Bus stop classification

- PT Interchange - 0
- Premium - 0
- Intermediate - 112
- ***Standard+* - 369**
- ***Standard* - 357**
- Basic - 15

Bus stop components



What now?

Turning classification and components into something useful

- In PTDG, classification is used to tell us what components are more important than others, depending on the stop context
- We can combine stop features and their quality with how important/necessary they are at a stop. Once we've done this, it gives us two things:
  - How does each stop perform against the guidance?
  - What is the network-wide picture of each component?

Remember this big table from before?

	Public transport interchange	Premium	Intermediate	Standard	Basic
Accessibility					
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Coloured surface treatment	Optional	Optional	Optional	Optional	Optional
Safety and security					
Street lighting	Essential	Essential	Essential	Recommended	Optional
Shelter with lighting	Essential	Essential	Essential	Recommended	Optional
Emergency help point	Essential	Recommended	Recommended	Optional	Optional
CCTV cameras	Recommended	Recommended	Recommended	Optional	Optional

We combine the classification of a stop…

With the ideal level of provision of a component…

And combine this with the status of a given component…

Feature requirement	Status	Potential deficiency
essential	not present	high
essential	quality issue	medium
essential	present	none
recommended	not present	medium
recommended	quality issue	low
recommended	present	none
optional	not present	none
optional	quality issue	low
optional	present	none

…to get a potential level of deficiency

Now we can build a score for each stop…

Potential Deficiency																	
kerb height	hardstand	TGSI	connecting footpath	crossing facility	bus stop sign	bus box	bus stop text	no stopping marking	street lighting	shelter lighting	seating	shelter	rubbish bin	recycling bin	stop-specific timetable	public art	community noticeboard
medium	none	medium	none	medium	none	none	medium	low	none	high	low	medium	none	none	none	none	none

2 + 0 + 2 + 0 + 2…. Etc.

Total score = 15

Repeat this for every stop….

- Network view
- Kerb Height
- Hardstand
- TGSI
- Connecting footpaths
- Crossing facility
- Bus stop sign
- Bus box
- Bus stop text
- Taper
- Street lighting
- Shelter lighting
- Seating
- Shelter
- Rubbish bin
- Stop-specific timetable
- Public art
- Community noticeboard

orc_bus_stops_audit_revC

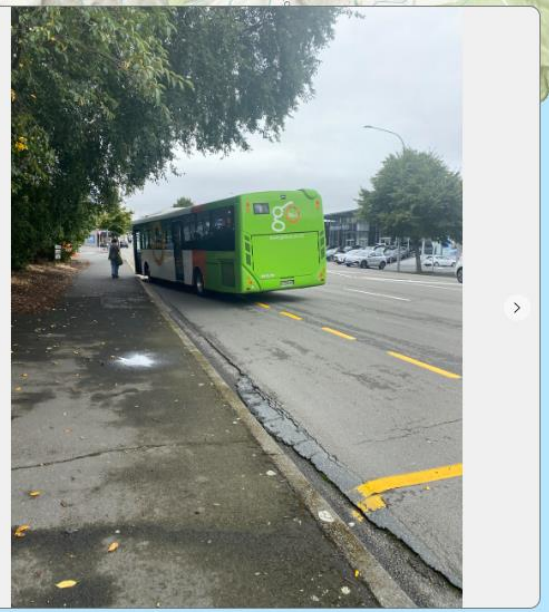
Deficiency score

- > 17.4
- 13.1
- < 9

Princes St, cnr Manor Pl

Stop summary

stop_id	59000781
stop_name	Princes St, cnr Manor Pl
Stop classification	Intermediate
Deficient elements (%)	50%
Non-deficient elements (%)	50%
Low deficiency elements (%)	5.56%
Medium-deficiency elements (%)	38.89%
High-deficiency elements (%)	5.56%
Deficiency score	18



Network-wide picture

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- Network view
- Kerb Height
- Hardstand
- TGSI
- Connecting footpaths
- Crossing facility
- Bus stop sign
- **Bus box**
- Bus stop text
- Taper
- Street lighting
- Shelter lighting
- Seating
- Shelter
- Rubbish bin
- Stop-specific timetable
- Public art
- Community noticeboard

Bus box - high deficiency heatmap

High

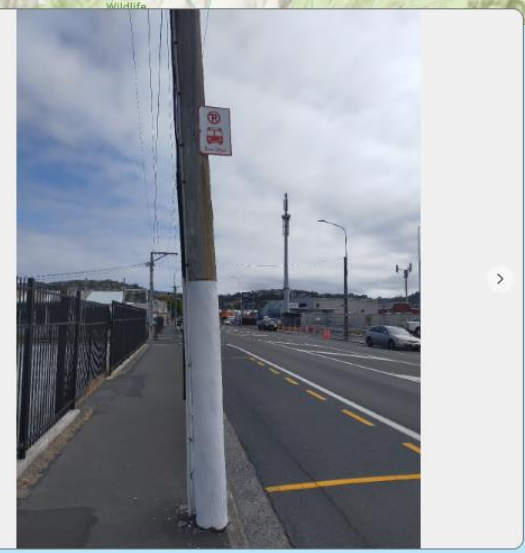
Low

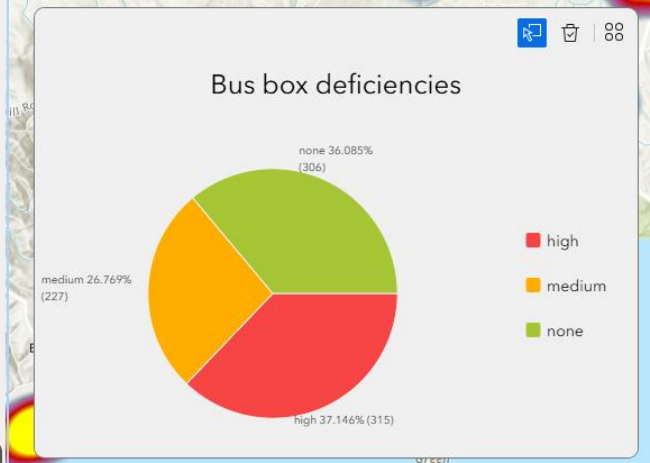
< 731 of 848 >

Hillside Rd, 319

Bus box info

stop_id	59001060
stop_name	Hillside Rd, 319
stop_classification	Standard+
Bus box road marking	13.20
Bus box presence	Yes
Driveway in bus box	Middle
bus box_req	Essential
bus box_comp	Quality Issue
bus box_def	medium





By component

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Special thanks to Jack Cowie and the ORC team

Ngā mihi | Thank you

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TE WHAKAMAHERE ME TE HOAHOA WAKA