

Unit 5: Network Operations Planning

Module 5-3

Road Space Allocation and Road Use Priority



Traffic Management Training Module



Today's presenter

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Road User Priority Map

Which trip purposes (which end-opportunities) are prioritised in a design for roads?

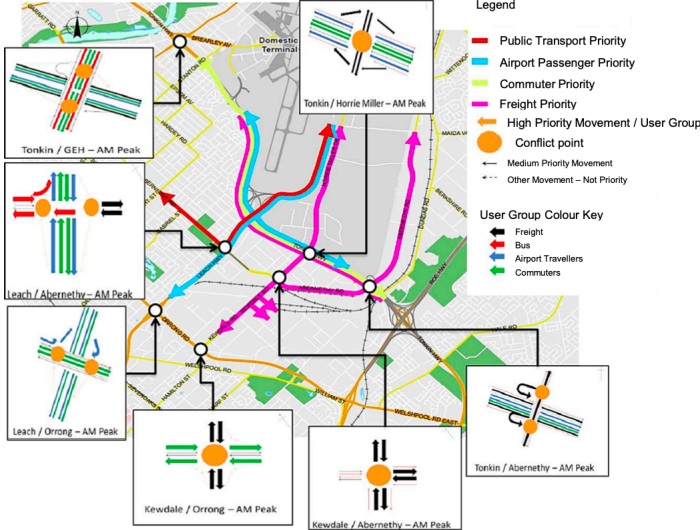
Which modes are particular routes prioritised in designs on roads?

The examples shows some routes are for public transport, some for freight, some for taxis, some for pedestrians,

Similarly some for airport passengers, others for through traffic (cars)

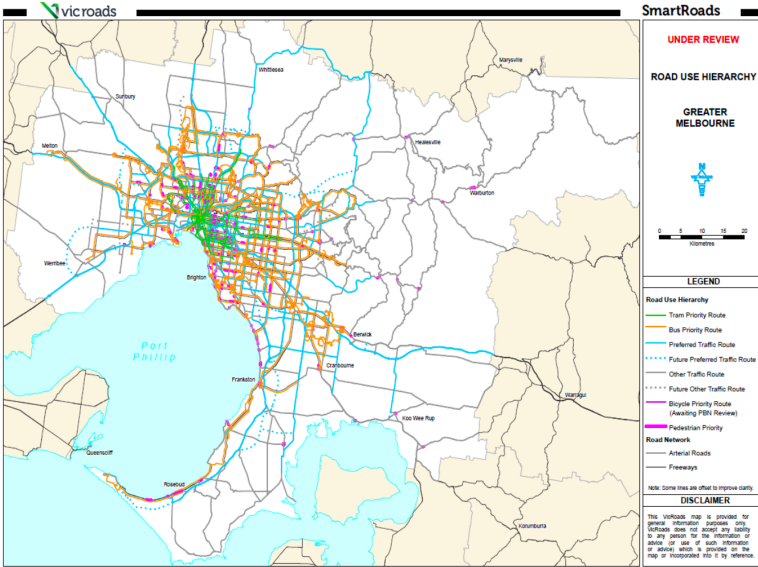
This can be done for a local area (e.g. the airport) or the metropolitan region.

Figure 4.4: Road user priority map showing AM peak priority



Source: Gateway Vision (2012a and 2012b).

Figure 4.5: Metropolitan road use priority map

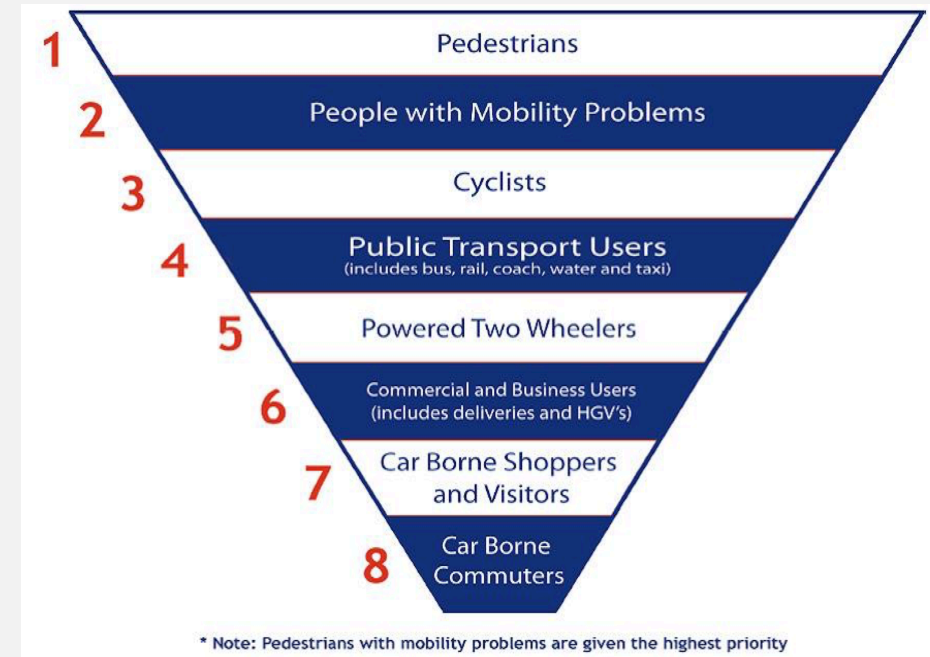


Source: VicRoads (2008).

Road User Hierarchy

New Zealand College of Public Health Medicine Policy Statement on transport says

“The NZCPHM supports transport user hierarchy approaches for the development and funding of better transport and urban systems. Transport users’ hierarchies prioritise active transport first, then public transport, followed by business and freight, and finally the use of private vehicles for personal transport”



Source: City of York

This is consistent with general Australia Guidance

Consider pedestrians first (and private vehicles last) for several reasons:


Equity: Pedestrians are the most vulnerable user. A pedestrian crashing into a car will not damage the car or its occupants in the same way that a car crashing into a pedestrian will.

Efficiency: Pedestrians require less infrastructure

Environment: Pedestrians impose much lower social costs on society.

Health: People should be encouraged to walk by public policy.

Figure 6.6 Potential urban road user hierarchy

Street or road type	Shared Zone* with mixed traffic considered on a case by case basis	High pedestrian activity areas	Most urban roads	Urban arterial roads	Motorways and national highway network
Vehicle speed	< 20km/h	15-40km/h	40-60km/h	60-90km/h	90-110km/h
				Pedestrians + bicycles fully separated from vehicles	Pedestrians + bicycles fully separated from road environment
Consider first 	Pedestrians	Pedestrians	Pedestrians on footpaths		
	Bicycles	Bicycle lane on road	Wide bicycle lane on road or shared path**		
	Public transport	Public transport	Public transport	Public transport	Freight vehicles
	Service vehicles	Service vehicles	Service vehicles	Freight and goods	Public transport
	Goods delivery	Goods delivery	Goods delivery	Service vehicles	Service vehicles
	Consider last	Private vehicles	Private vehicles	Private vehicles	Private vehicles

Source: Compiled from multiple sources including Austroads 2010, *Infrastructure / Speed Limit Relationship in Relation to Road Safety Outcomes* and Austroads 2009, *Guide to Traffic Management: Part 4: Network Management*.

Figure 6.6 Infrastructure Australia: Walking, Riding, and Access to Public Transport (October 2012)

Münster: Street Space for 60 people

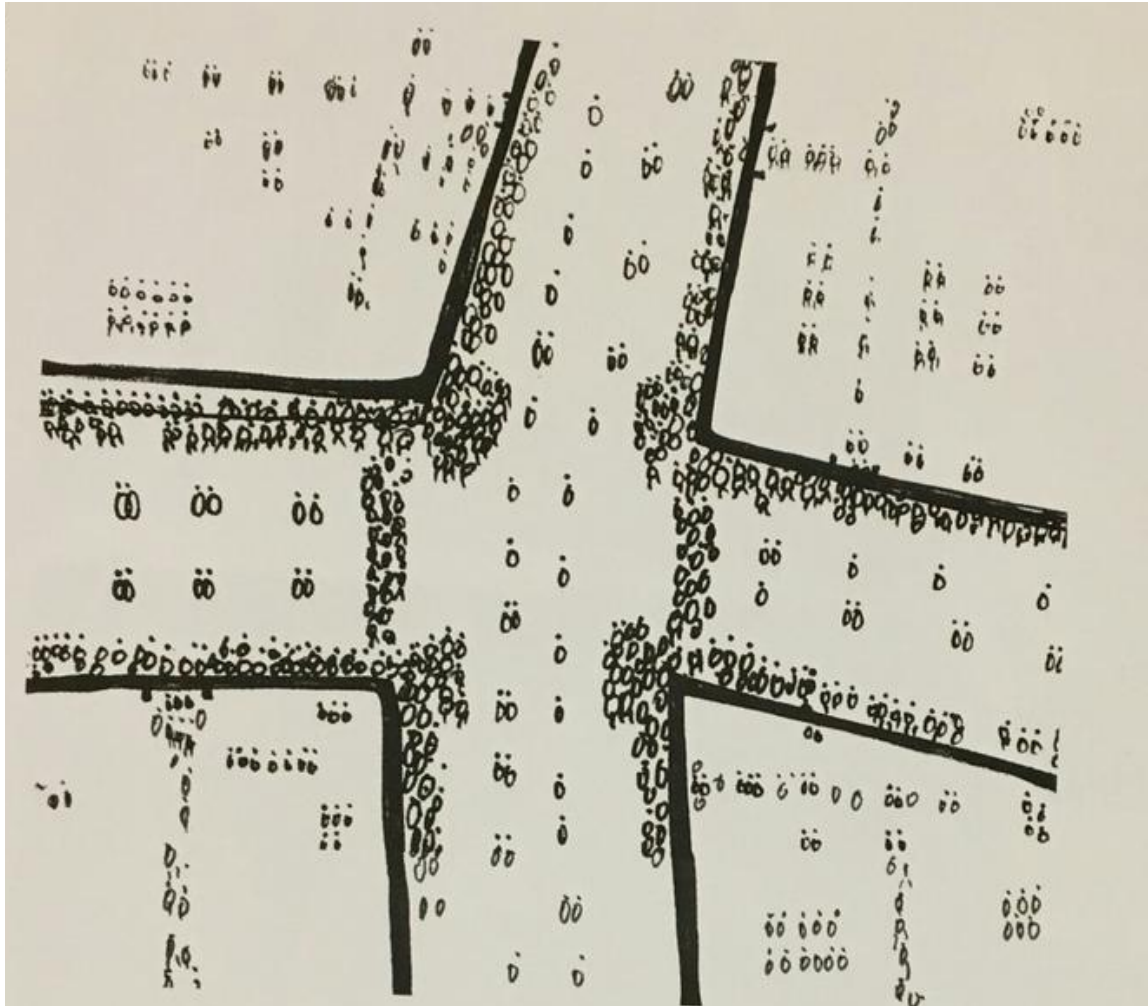


Source: City of Münster

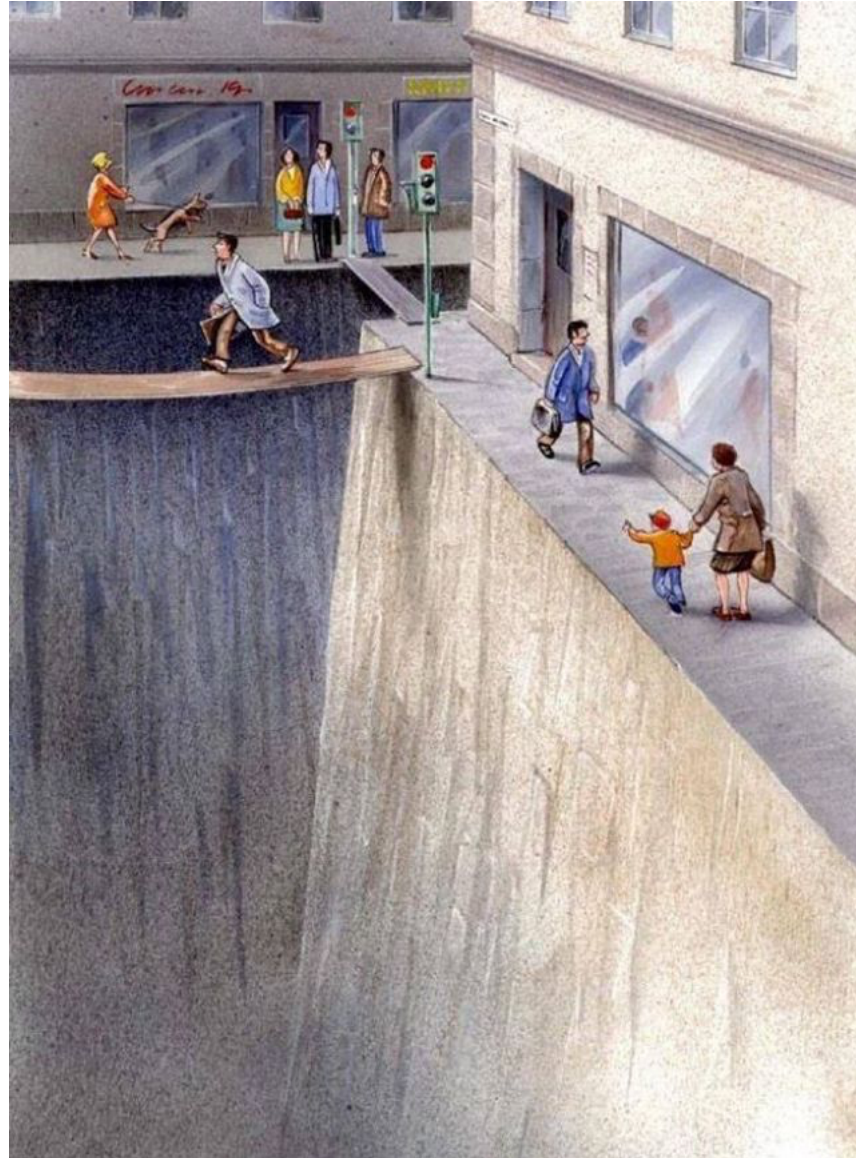




Source: TV Ad for Saturn Cars



Source: Terry Farrell, Sketch



Source: Swedish Roads Authority, by: [Karl Jilg](#)



Source: Todorovic

Our Covid Future?



Lane management plan

A lane management plan identifies how road space is divided between various user groups.

Some users, e.g. buses, high-occupancy vehicles might be allocated lanes because they carry more passengers.

Some lanes may switch direction by time-of-day to accommodate the tidal flows of traffic.

Some lanes may be allocated to car storage when the demands for movement are not high.

Some lanes may be allocated to bicyclists and other micromobility users to improve system safety and encourage use of less environmentally damaging modes.

Figure 4.7: Lane management plan for a region



Source: VicRoads (2008).

First Path

- Walking
- User powered vehicles (scooters skateboards bikes)
- Low speed robotic delivery



Source: Jesse Vermeulen Unsplash



Source: David Levinson



Source: David Levinson



Source: Starship Robotics

Second Path: The Road

Animal powered vehicles,

Motor vehicles

Bikes?



Source: David Levinson

Third Path

Bikes, Scooters, Skateboard, etc.

Electric Bikes, Electric Scooters, Hoverboards, etc.



Source: David Levinson



Source: David Levinson

Fourth Path

Buses

High occupancy vehicles



Source: David Levinson



Source: David Levinson

Signal Operation Plan

Who gets priority on which streets, and at intersections?

If the objective is moving people, rather than vehicles, the modes with the greatest **flux** (persons per hour per meter of road width) should get **priority**.

This differs from much conventional practice which treats all vehicles equally, and doesn't count the number of pedestrians, bicyclists, or bus passengers.

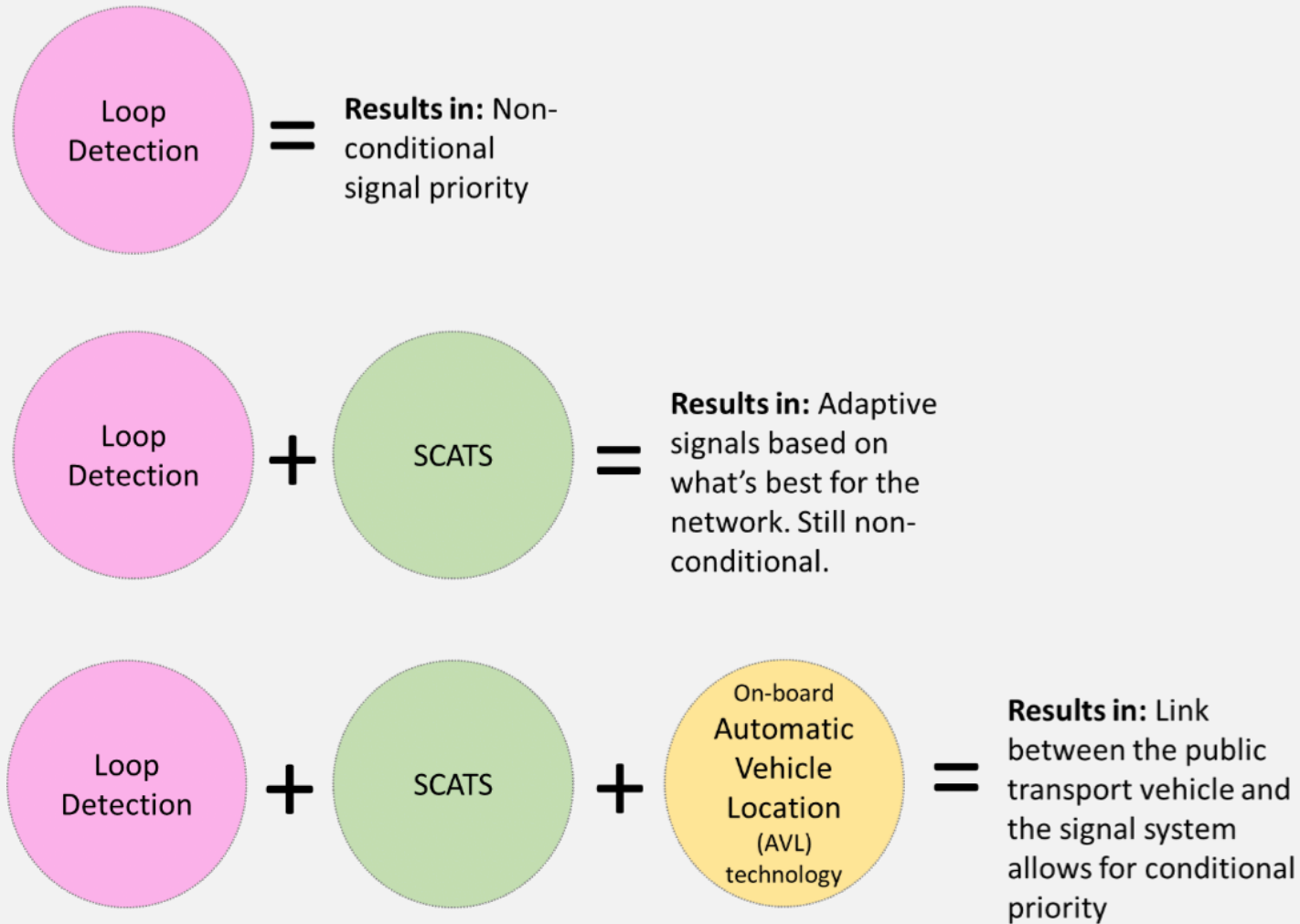
But also remember, you get what you design for. You cannot estimate the demand for a bridge by counting the number of swimmers. If the environment is hostile to public transport or bicycling, you will have fewer people using those modes.

Figure 4.6: Signal operation plan for a region



Source: VicRoads (2008).

Using SCATS and AVL to Improve on Loops



- But what about pedestrians?

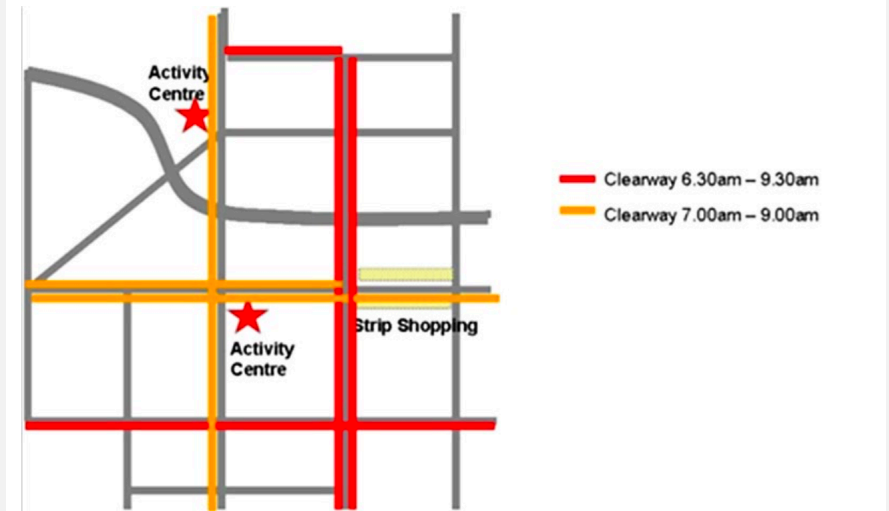
Parking Car Storage Management Plan

Storing cars is important, cars cannot be in motion 24/7/365. Storing cars on scarce road space less so.

A parking car storage management plan identifies when and where it is appropriate to use public roads for car storage.

Clearways identify road sections where car storage is prohibited at certain times of the day, when they interfere with the movement of people.

Figure 4.8: Parking management plan for a region



Source: VicRoads (2008).

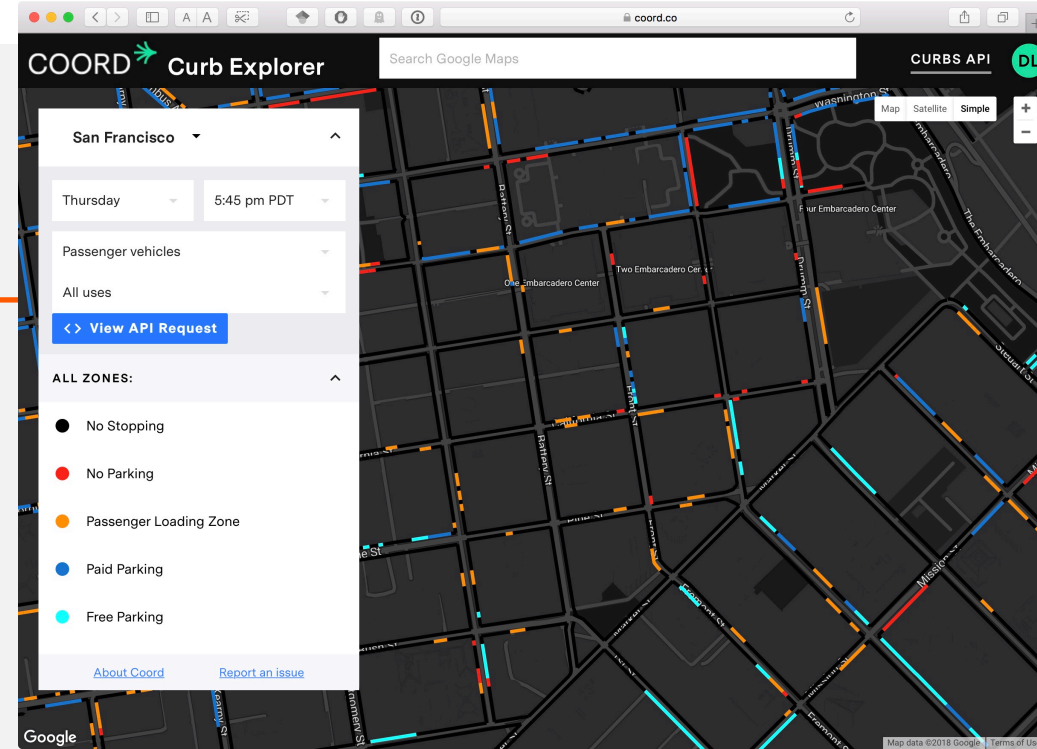
Kerb Management Plan

The Kerb - Once a nondescript piece of concrete, now the edge (both physically and metaphorically) of the sharing economy: taxis, Ubers, autonomous mobility services.

Who manages kerbspace?

How is it regulated?

Is it even mapped?

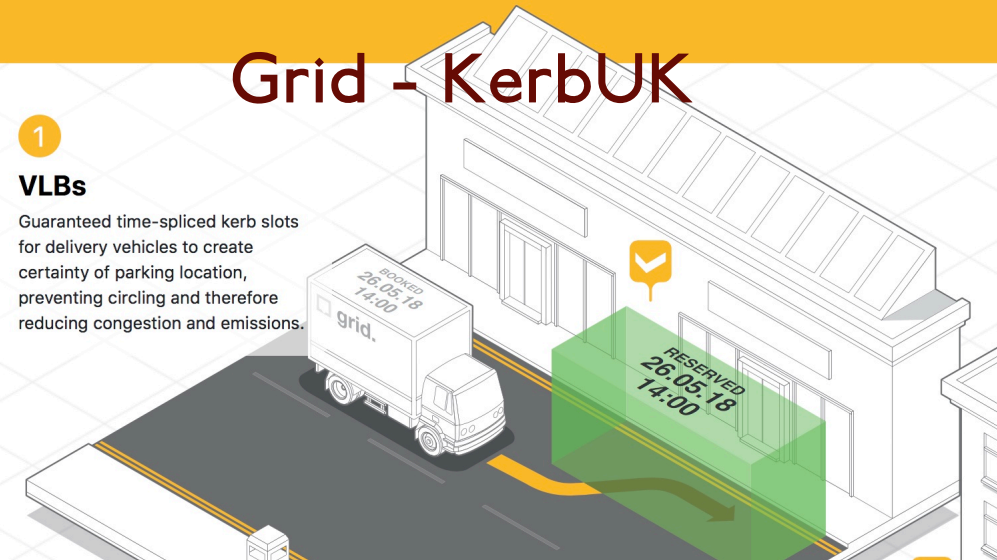


Grid - KerbUK

1

VLBs

Guaranteed time-spliced kerb slots for delivery vehicles to create certainty of parking location, preventing circling and therefore reducing congestion and emissions.




Conclusions

The management of road space is embedded in the **values** of how we want communities to function.

We should not simply allocate space based on current use, as that makes it harder to change behaviour.

It **should** instead be allocated based on **how we want communities to work**. If we want more people riding bikes, more space should be given to bicyclists.

If people need a 2m physical distance, more footpath space needs to be allocated, rather than telling people they cannot safely walk.




Crowds

... and the Street Car's answer

OUT of the multiplying perplexities of the traffic problem, one fact emerges clearly; the electric street car is our most efficient means of moving masses of people.

The street car passenger occupies six square feet of traffic space. The automobile passenger requires an average of 44 square feet. In thirty of our largest cities, street cars are now carrying over 30,000,000 passengers daily. Attempt to put them in automobiles, and the street—which cannot easily expand its curbs—would be too narrow to hold them.

The street car is handling the crowds. Hundreds of capable and far-seeing street railway executives are busy modernizing equipment and improving schedules so that to-morrow and the day after, winter and summer, this essential public servant may do its work even better and win a still larger measure of popular cooperation.



The next time you board a street car, notice how smoothly it starts and stops, how quickly it gathers speed. Much of this improved equipment carries the General Electric monogram—the same monogram as on the efficient and dependable electric appliances that save time and labor in the electrified home.

GENERAL ELECTRIC

Automobile Actual Size



1 Trolley Coach Will Seat All the People Who Ordinarily Ride in 24 Automobiles Requiring at Least 10 Times As Much Street Space*

WE ASKED our trick photographer to make a picture showing you an automobile in its true light—considering the number of people it usually carries and the amount of street space it occupies. Even though the result looks monstrous we assure you it's very much on the conservative side. Now we don't propose to hinder progress. The fact that almost every American family can own an automobile is a fine thing. But when they use automobiles in the limited street space of a city to the extent of accidents or never using the public transit system, thus causing stagnation of traffic, then it is time for traffic engineers to go to the source of the trouble. The way to reduce traffic congestion is to revitalize

the **MOST EFFICIENT USER OF STREET SPACE—THE PUBLIC TRANSIT SYSTEM.** Any city government can render the citizens a real service by co-operating with the transit company to modernize and *promote increased use of its system.*

People like to ride in modern electric coaches. They carry them swiftly, reliably, comfortably, and at low cost. Furthermore, this means of travel pays its own way. We think that when the facts are known they will appeal far more to the people than huge expenditures for street widening, express highways, and municipal parking lots which load them with unfairly proportioned taxes—and never provide more than a partial solution of the problem.

*Based on the national city average of 1.22 passengers per automobile.

REVITALIZE PUBLIC TRANSIT TO REDUCE TRAFFIC CONGESTION

GENERAL ELECTRIC

Source: Oatman-Stanford (2014)

Questions



Question 1









- Rank the road users in order of priority in a road user plan from most important to least important?
 - A. Motorists
 - B. Public Transport Users
 - C. Bicyclists
 - D. Pedestrians
 - E. People Storing Vehicles

Answer 1

- Which road users should be prioritised in a road user plan from most important to least important?

1. Pedestrians
2. Bicyclists
3. Public Transport Users
4. Motorists
5. ~~People Storing Vehicles~~

Figure 6.6 Potential urban road user hierarchy

					
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Source: Compiled from multiple sources including Austroads 2010, *Infrastructure / Speed Limit Relationship in Relation to Road Safety Outcomes* and Austroads 2009, *Guide to Traffic Management: Part 4: Network Management*.

Question 2

- Which of the following plans (select more than one) would need to be reconsidered when pedestrianising a shopping street?
 - A. Road User Priority Map
 - B. Lane Management Plan
 - C. Signal Operations Plan
 - D. Car Storage Management Plan
 - E. Kerb Management Plan

Answer 2

- Which of the following plans (select more than one) would need to be reconsidered when pedestrianising a shopping street?
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 - C. Signal Operations Plan
 - D. Car Storage Management Plan
 - E. Kerb Management Plan

All of them

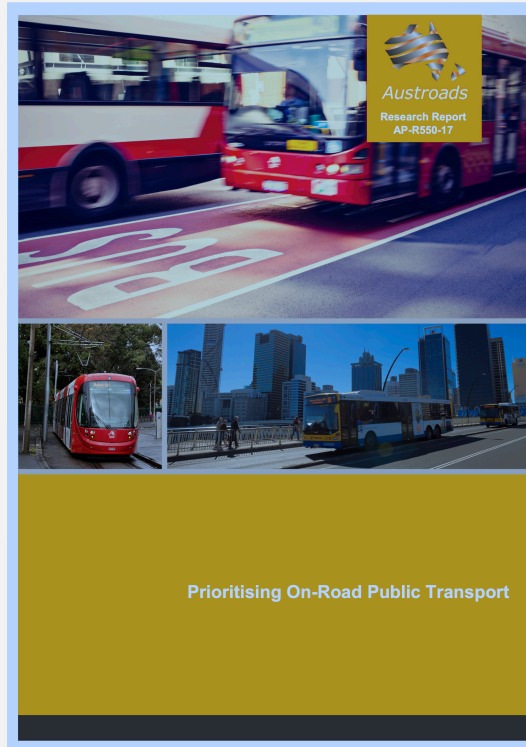
Question 3

- What term refers to the measure of the number of persons per hour per meter of road width?
 - A. Flow
 - B. Flux
 - C. Density
 - D. Volume
 - E. Occupancy
 - F. Speed

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Austrroads report



Some of the information from this presentation is conveyed in the Austrroads Report: Prioritising On-Road Public Transport.

This report can be downloaded from Austrroads Website:
<https://austrroads.com.au/publications/network/ap-r550-17>