TECHNICAL PAPER

THE BENEFITS OF DEVELOPING A DESTINATION SIGNAGE STRATEGY AND NETWORK

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ABSTRACT

Destination signage facilitates the safe and efficient movement of travellers throughout the road network. This paper discusses the reasons for a destination signage strategy (including political reasons), what is involved, and some tricks of the trade to avoid common pitfalls.

Five reasons for developing a destination signage strategy are to improve network:

- Safety
- Efficiency
- Consistency
- Amenity
- Identity

This paper will expand on the above, assess a Benefit Cost analysis, identify areas that can be investigated further, identifies the supporting legislative and policy documents, identifies some common pitfalls, and highlights the need for a regional approach.

INTRODUCTION

Destination signage facilitates the safe and efficient movement of travellers throughout the road network, connecting people, places and products. Destination signage is very visible, and to the untrained eye looks relatively simple to design. However, it is a complex process and it is important to develop a strategy to ensure consistency and continuity along routes and throughout the road network.

This paper describes the components of a destination signage strategy, the strategic benefits, and the benefits to the road network and community in general. It will then identify supporting legislative and policy documents, some common pitfalls, and highlight the need for a regional approach.

Destination Signage Strategy

The process of developing the Destination Signage Strategy is broken down into the ten steps, which are outlined below:

1. Create map of existing destination signage
2. Condition review of existing destination signage
3. Strategic review of existing destination signage
4. Review existing road network and future changes to it
5. Review neighbouring Road Controlling Authority (RCA) signage
6. Review of NZTA signage
7. Proposed signage strategy - logic diagrams
8. Review of urban route signage
9. Develop prioritised Capital Works Programme
10. Detailed design, consultation and implementation

The first step is to survey the entire signage network, taking photos and creating a map and database. Secondly, during the survey it is important to assess the condition of the existing signage for inclusion in the prioritised capital works programme.

The third step is to review and develop the strategy by undertaking a robust assessment of the destinations. Destinations are split into Primary, Secondary, Tourist and External destinations and then rationalised by consultation with the RCA. Primary destinations are typically larger town centres, where as secondary destinations are typically smaller commercial areas. The fourth, fifth and sixth steps are undertaken by reviewing District Plans, Access Strategies and Transport Planning Corridor Study reports to identify the arterials routes, and changes proposed to the network. The proposed signage strategy is developed using logic diagrams.

Logic Diagrams are maps that identify the main destinations and where they are signed to and from (also known as path finding). Primary destinations are plotted in different colours first, and secondary destinations are added where possible. The goal is not to have more than two destinations per direction (six lines of text), although this is not always possible. Logic Diagrams for parts of the Auckland region are shown in Figures 1 - 4 overleaf.

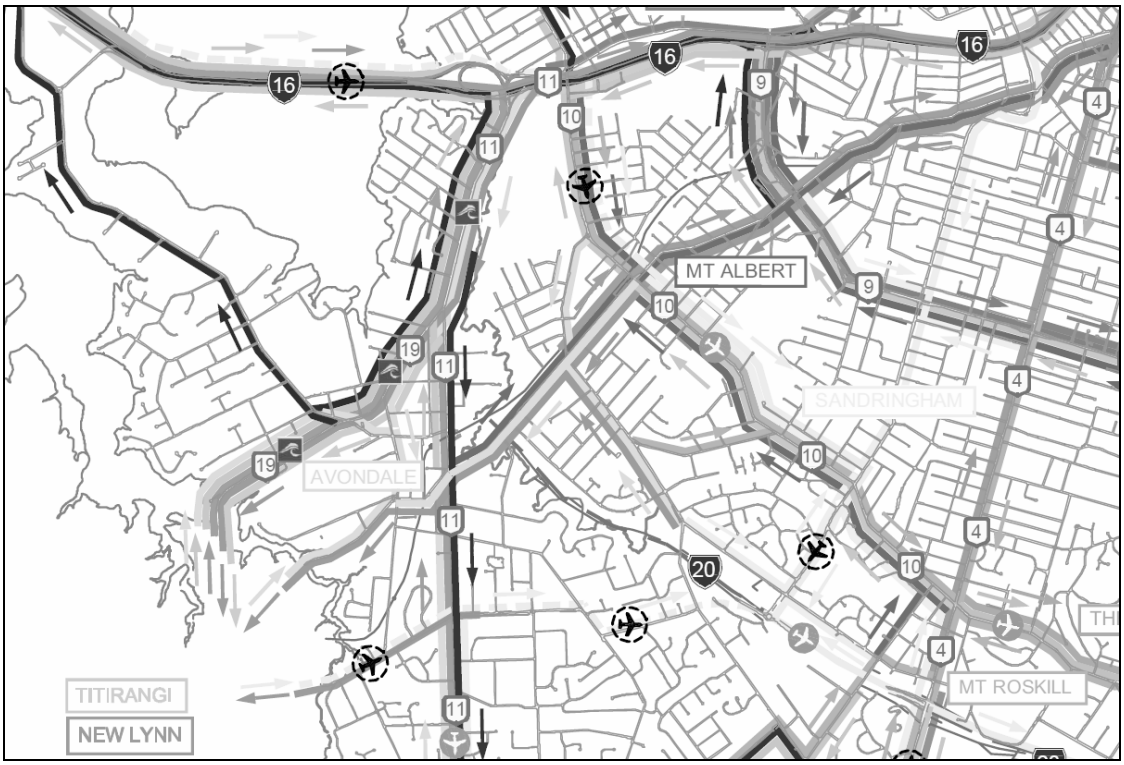

Figure 1: Auckland City Destination Signage Logic Diagrams

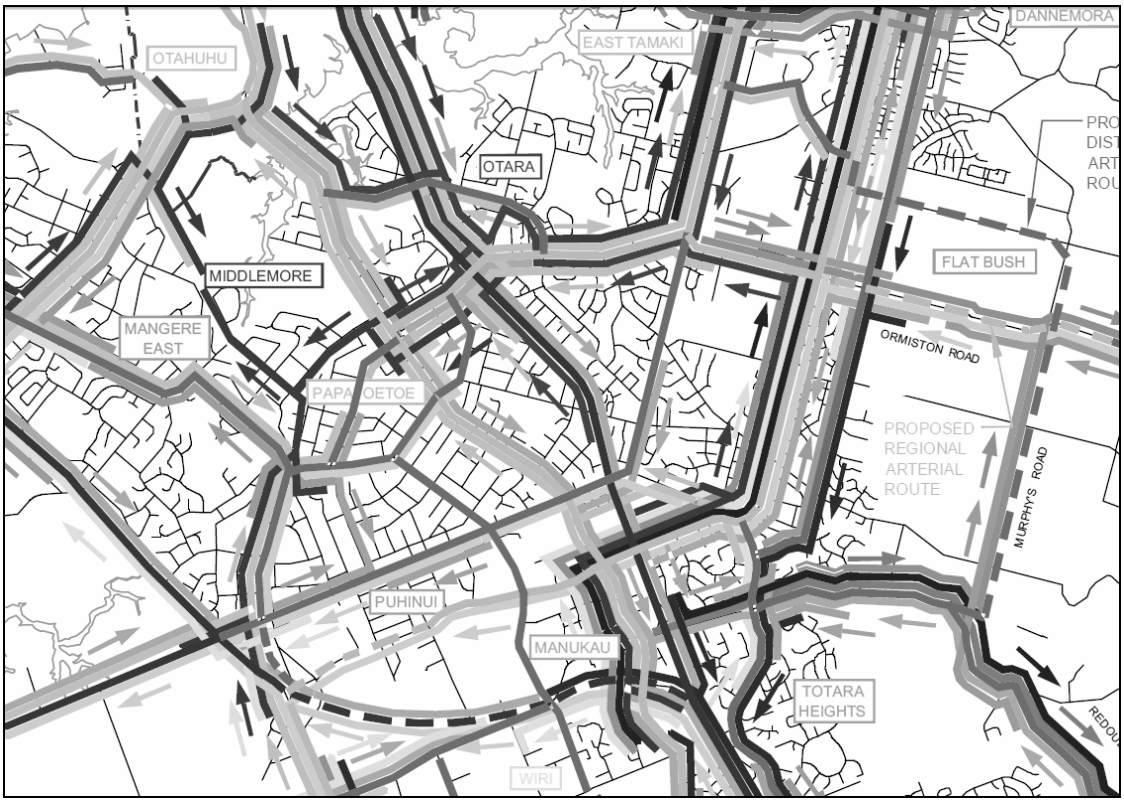

Figure 2: Manukau City Destination Signage Logic Diagrams

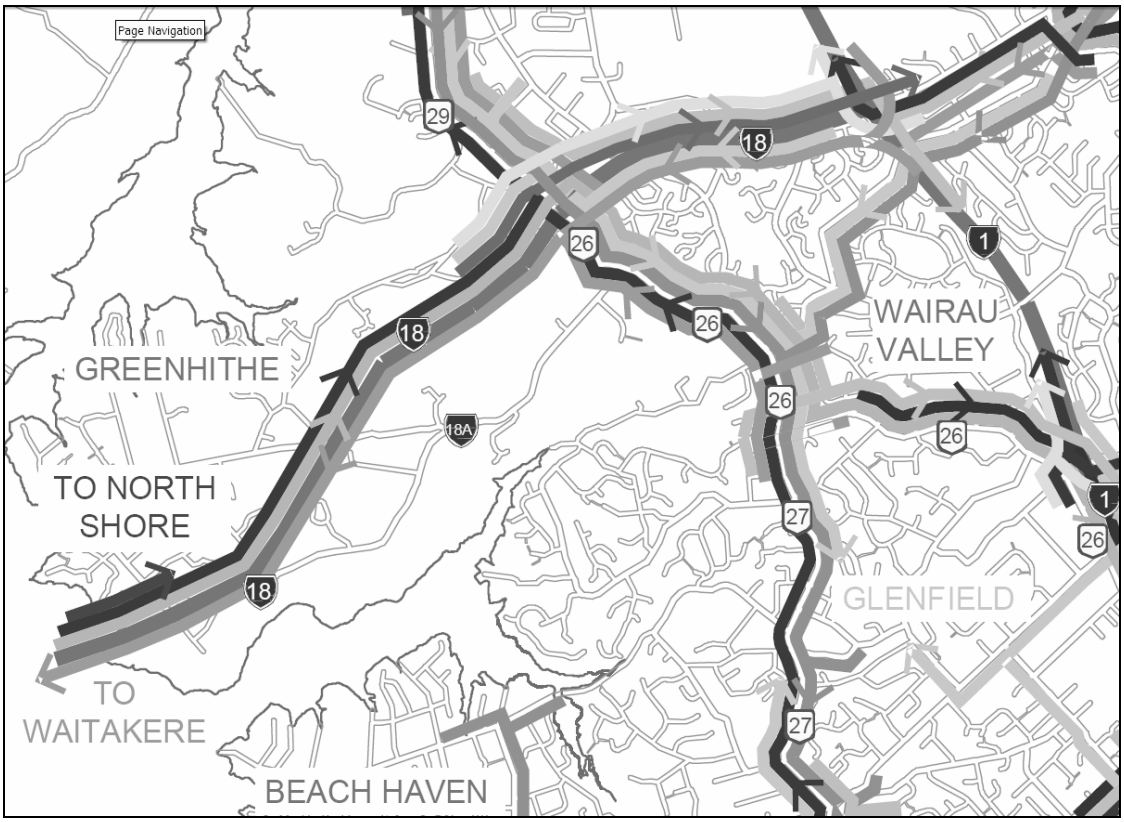

Figure 3: North Shore City Destination Signage Logic Diagrams

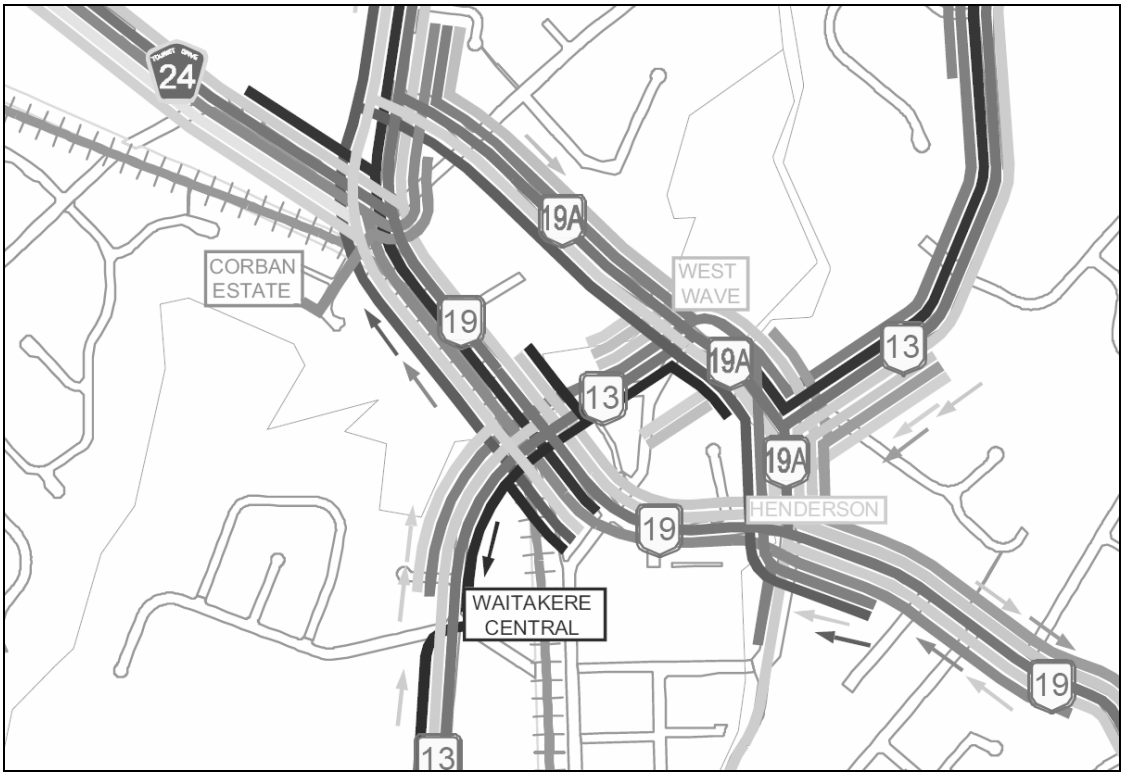

Figure 4: Waitakere City Destination Signage Logic Diagrams

BENEFITS OF A DESTINATION SIGNAGE STRATEGY

The logic diagrams produced show the destinations that are meant to be signed at or through the intersection, which is extremely helpful for designing signs at any intersection or interchange upgrade e.g. SH20 Mt Roskill Extension, SH20-1 or SH16-SH18 Hobsonville deviation. By looking at the intersection(s) on the logic diagrams, the primary and secondary destinations on each approach can be identified and incorporated into the signage. As described above, the benefits include continuity of destination signage (no gaps), and consistency across RCA boundaries (destinations not missed out). The logic diagrams can be used to visually show politicians, urban designers and local residents how signs contribute and fit in to the local and regional road network.

Developing the strategy and network also meet the objectives of Local, Regional and National Government Policies, as identified later in this paper.

BENEFITS OF A DESTINATION SIGNAGE STRATEGY TO THE NETWORK

There are five benefits that destination signage brings to a network:

- Safety
- Efficiency
- Consistency
- Amenity
- Identity

Safety benefits

Destination Signage, in particular Advance Direction Signage:

- Provides clarity at complicated intersections
- Correct lane choice, less sudden lane changes
- Reduces U-turns and U-turn crashes
- Reduces people getting lost, especially in unfamiliar places or at night. This is also known as Crime Prevention Through Environmental Design (CPTED)
- Improves emergency service response time (Police, Fire, Ambulance)
- Improves the ability of locals to find hospitals in emergency situations
- Reduces driver frustration

Efficiency benefits

- Reduces congestion
- Reduces unnecessary travel in wrong direction
- Reduces travel time
- Reduces time spent trying to establish location and correct route to destination
- Reduces vehicle operating costs – less fuel, tyre and brake use etc
- Reduces environmental costs – less pollution, reduces carbon footprint
- Reinforce road heirarchy and function of arterial roads
- Improves economic efficiency for freight
- Improves lane utilisation

Consistency across the region

- Provides continuity along the route
- Provides consistency across Road Controlling Authority boundaries e.g.

- Auckland City
- North Shore City
- Manukau City
- Waitakere City
- New Zealand Transport Agency

Amenity benefits

- Directs visitors to civic amenities / venues
- Improves mobility and access
- Reduces driver frustration
- Promotes tourism – tourist routes, scenic drives, wineries, regional parks, historic places etc
- Directs tourists/vistors to airports

Identity

- Provides positive recognition of suburbs/communities
- Builds and reinforces community awareness, sense of place
- Provides a greater sense of cohesion and familiarity
- Subconsciously builds confidence of ability to 'get around' / navigate

Each of the benefits above are analysed and quantified in the Benefit Cost Analysis described below.

BENEFIT COST ANALYSIS

Crash Savings

Advance Direction signs, are signs that facilitate correct lane choice and less sudden lane changes at complicated intersections.

We have investigated and identified the crashes saved by signage in Crosswell, D. (2009), *Waitakere City Council, Report for Advance Direction Sign Installation Benefit Cost Analysis*, Unpublished Report, GHD Ltd.[1]

The difficulty is being able to quantify the number and type of crashes that could be attributed to a lack of advance direction signage. Austroads Part 4 - Treatment of Crash Locations[2] does not give a crash reduction rate for advance direction signage. The Land Transport Safety Authority published a study in 1996 on crash savings at bends using chevron signs that achieved significant crash reductions (up to 70%).[3] However, significantly less (more conservative) crash savings (under 5%) has been used in our analysis to date.

In terms of safety and consequences, making a wrong turn on the narrow roads (e.g. in the Waitakere Ranges) are the most significant. The reason it is important to address the areas outside the urban limits in particular, is that attempting to make a u-turn on one of the many blind corners in the Waitakere Ranges is very dangerous. Lost drivers also tend to slow down, make erratic manoeuvres and are generally distracted from the task of driving, while trying to establish where they are, and which way to go. The time and distance travelled to

[1] Crosswell, D. (2009), Waitakere City Council, Report for Advance Direction Sign Installation Benefit Cost Analysis, Unpublished Report, GHD Ltd.

[2] Austroads Part 4 Treatment of Crash Locations, 1994

[3] Land Transport Safety Authority Treatment at Bends Using Chevrons September, 1996

either realise they are travelling in the wrong direction, or to find a safe place to turn around, is also magnified in open road speed restriction areas, as is the potential severity of the crashes.

The obvious crash type that could be reduced is U-turn crashes, where drivers have missed or taken a wrong turn and have attempted to turn around. We have assumed a typical crash saving on U-turn crashes, assuming that drivers involved in U-turn crashes on arterial roads are lost or have missed the turn off they intended to take.

However, many lane change crashes, rear end crashes, pedestrian crashes and most other crashes could perceivably be attributed to lost drivers. Lost drivers try to locate landmark features to reorient themselves, and are potentially distracted from the task of driving.

A nominal percentage reduction in all crashes on arterial roads has been assigned to arterial roads that don't have signage.

In summary, we have assumed:

- Typical crash saving in u-turn manoeuvring crashes (MB and MC); and
- Nominal crash savings for all other crashes on arterial roads

As discussed above, these are conservative savings, and quantifying the crash savings of destination signage is an area for further investigation.

Other Cost Savings

In our analysis, Travel Time Savings (TTS) and Vehicle Operating Cost (VOC) benefits have been included in addition to crash savings. These are efficiency savings that can be achieved by Advance Direction signs by:

- Reducing travel time;
- Reducing time spent trying to establish location and correct route to destination;
- Reducing vehicle operating costs – petrol, tyres, brakes etc;
- Reducing environmental costs – less pollution, lower carbon footprint;
- Improving emergency service response time;
- Reinforcing road hierarchy and function of arterial roads; and
- Economic efficiency for deliveries.

The TTS and VOC benefits included in this analysis assume that just 10,000 vehicles per day travel through the upgraded ADS network. In reality, a much larger overall number of vehicles will benefit from the ADS upgrades, and the TTS and VOC benefits are likely to be higher, improving the BCR. The EEM software only allows a maximum AADT of 100,000.

Quantifying the crash and cost savings of destination signage are areas for further investigation.

Intangible Benefits

There are a number of intangible benefits that are difficult to quantify:

- Reducing driver frustration;

- Reducing people getting lost (in unfamiliar places and at night) i.e. Crime Prevention Through Environmental Design (CPTED);
- Directing visitors to civic amenities / venues;
- Promoting tourism;
- Positive recognition of suburbs/communities;
- Building and reinforcing community awareness;
- Greater sense of cohesion and familiarity; and
- Subconsciously building confidence of locals and visitors to navigate the area

SUPPORTING LEGISLATION AND POLICY DOCUMENTS

The appropriate use of Advance Direction Signs can greatly enhance the efficient and safe use of a roading network, while an ill-conceived system can be a large contributing factor to increased travel time and traffic crashes. Installing Advance Direction signage is an effective way of improving the use and operational efficiency of the existing transport network, which is 'priority one' of the Auckland Regional Transport Authority's (ARTA's) Land Transport Programme[4]. Building a consistent, coherent high quality signage network is also identified as a key principle in ARTA's Regional Arterial Road Plan[5], released in February 2009.

Directional signage is particularly important for international visitors as well as visitors from outside of the area, and a comprehensive and consistent directional signage system is important to maintain Auckland and New Zealand's tourism friendly image.

Providing improved traveller information is identified in the Ministry of Transport's 'Sustainable Transport' discussion paper.[6] Further, in addition to benefits derived from crash reductions as outlined in the benefit/cost analysis undertaken by GHD Limited, the Advance Directional Signage network contributes to the aims of the New Zealand Transport Strategy,[7] including the development of key result areas such as improving the transport system and improving the integration of the transport network.

FUNDING

Destination signage invariably obtains economically viable BCR's, depending on the crash history and proportion of the network needing to be completed, and generally qualifies for LTNZ funding.

An excerpt from the Government Policy Statement (GPS)[8] is shown in Figure 5 below.

[4] 2007/2008 Auckland Land Transport Programme - Auckland Regional Transport Authority, 27 June 2007 (Section 4: Priority Statements)

[5] Regional Arterial Road Plan - Auckland Regional Transport Authority, February 2009

[6] Discussion paper: *Sustainable Transport – Update of the New Zealand Transport Strategy.* Ministry of Transport, December 2007

[7] Land Transport New Zealand, Report No, PM06 / 1324 T, November 2007

[8] Ministry of Transport, Government Policy Statement on Land Transport Funding 2009/10-2018/19, May 2009

Impacts that contribute to economic growth and productivity

- Improvements in the provision of infrastructure and services that enhance transport efficiency and lower the cost of transportation through:
  - improvements in journey time reliability
  - easing of severe congestion
  - more efficient freight supply chains
  - better use of existing transport capacity.
- Better access to markets, employment and areas that contribute to economic growth.
- A secure and resilient transport network.

Other impacts

- Reductions in deaths and serious injuries as a result of road crashes.
- More transport choices, particularly for those with limited access to a car where appropriate.
- Reductions in adverse environmental effects from land transport.
- Contributions to positive health outcomes.

Figure 5: Excerpt from the Government Policy Statement, May 2009

Destination signage achieves most of the impacts that contribute to economic growth and productivity.

From the NZTA's Planning, Programming and Funding manual, destination signage and destination signage strategies rate highly against the assessment factors identified:

- Strategic Fit,
- Effectiveness,
- Economic Efficiency,

and delivers on the objectives of the Land Transport Management Act (LTMA) 2003 and the New Zealand Transport Stratgegy (NZTS) 2008.

WHAT ARE THE PITFALLS?

Destination signage is sometimes designed without reviewing the RCA's Destination Signage Strategy, particular with localised intersection or interchange upgrades. Existing signage is relied on to be accurate, even though the road network could be changing. Additionally, designers simply pick up a map book and pick out suburb names, without including primary destinations that may be some distance away. State Highway, Urban Route, Tourist Drive and Scenic Route Markers are often missed out, as well as Airport and Hospital text and symbols.

Strategically, new areas develop e.g. Westgate/Massey North (NorSGA), and there is no consensus on what the area should be named. There are also vague destinations with no defined area, or alternatively there are areas with competing destination names. Generally, these issues are dealt with as part of the development of the destination signage strategy, in consultation with the Road Controlling Authority.

Another main strategic pitfall are destinations that are on or near RCA boundaries. This pitfall can be avoided by adopting a regional destination signage strategy approach.

The other pitfalls are mainly practical physical limitations, that can be resolved by proper site visits, and include:

- Clearance from carriageway
- Obstructing footpath
- Trees are often planted on the approaches to arterial road junctions and grow very quickly, obscuring signs and signals
- Vertical and horizontal geometry

CONCLUSIONS

Destination Signage is an essential part of any road network and helps to connect people places and products. Destination signage is a complex activity and a comprehensive strategy is required to ensure a consistent and complete signage network. There are sequential ten steps involved in the process to develop a destination signage strategy.

Consultation and liaison with neighbouring Road Controlling Authorities is essential.

Logic Diagrams are maps that identify the main destinations and where they are signed to and from (also known as path finding). Logic Diagrams are an extremely useful tool to ensure a consistent and complete signage network.

The benefits include continuity of destination signage (no gaps), and consistency across RCA boundaries (destinations are not missed out). The benefits of destination signage are not limited to safety and efficiency, but extend into the the community and environment.

From the NZTA's Planning, Programming and Funding manual, Destination Signage and Destination Signage Strategies rate highly against the assessment factors of 'Strategic Fit', 'Effectiveness' and 'Economic Efficiency'.

The most common pitfall, when it comes to destination signage, is not having a strategy, or not referring to the strategy if it exists. Site visits are always necessary to assess the intersection layout, geometry, vegetation and other road side features, and also to determine sign, pole and footing type and dimensions.

Going forward, a regional approach is needed and quantifying the crash and cost savings of destination signage are important areas for further investigation.

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