

## Te Ao Māori Transport Knowledge Hub

Friday 16 April 2021, 10am – 12pm, Zoom.

**Te huarahi tika, ka ora ai te reo Māori – The road to bilingual traffic signage in Aotearoa**

Facilitators: Matt Gifford (Manatū Waka) and Nicholas Manukau (Waka Kotahi)

1000 – Atinga

- Welcome from Matt and Nicholas
- Presentation – Bilingual Traffic Signage: International experience & outcomes  
*Dr Maggie Trotter & Kai O'Donnell, Waka Kotahi*
- Next steps – Nicholas Manukau
- Questions – facilitated by Nicholas Manukau
- Discussion – facilitated by Matt Gifford

1200 – Whakamutunga

  
**Transport  
Knowledge Hub**

The background image shows a road scene. On the left, a green diamond-shaped sign with black silhouettes of two children running is visible. Below it is a rectangular sign with the word 'KINDERGARTEN' in German. A large blue and red truck is driving on the road. The image is partially covered by a dark blue diagonal overlay on the right side.

# Bilingual Traffic Signage: International experience & outcomes

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Dr Maggie Trotter & Kai O'Donnell,  
Enterprise Change: Behaviour and Choice

# About Us

Corporate Support > Enterprise Change > Applied Design > **Behaviour & Choice**

- Cross-cultural psychology
- Human Factors psychology
- Cognitive and behaviour impacts of signage



Jeremy O'Brien – Manager



Dr Maggie Trotter



Elizabeth Claridge



Kai O'Donnell

# What's the international experience?

## 1. “Standard” practice

- a. 18-countries sampled
- b. 33+ languages.

## 2. Common drivers

- a. Cultural protection
- b. Cultural aspiration
- c. Safety enhancement
- d. Commercial motivation.

## 3. Not without its challenges

- a. Realistic challenges versus unrealised fears
- b. Complexity, Safety, Cost.

## 4. But can be safely done

- a. Consensus is in favour
- b. Balancing trade-offs.

# The research context

Proposed to the Minister in MIN-3512 Te Reo Maori Policy for Road Signs in November 2020:

1. What are the preferences and aspirations of Māori for the language on road signage?
- 2. What are the likely impacts of bilingual signage on road safety?**
- 3. What can we learn from international experiences with introducing bilingual signage?**
4. What words and phrases could be used and, how might national consistency fit with appropriate local expression?
5. What are the best mechanisms for using and representing Te Reo Māori on roadside infrastructure and in road safety messaging?

# How we did this

1. **Scan of international practice**, focusing on Europe then, North America and Asia
2. **Sources included academic literature**, organisational publications, and image searches.
3. **Deep dive, case study Wales**
4. **Overview of** Finland, IRL, Scotland, Spain, China, Japan, Canada, USA.

## Investigating:

- i. Signage details
- ii. Process details
- iii. Impact on safety
- iv. Impact on community
- v. Other ways indigenous languages or culture have been included.

# Where are they used?

Table 3. Overview of bilingual traffic sign types in use.

Region	Informational	Directional	Warning	Regulatory
European Union	✓	✓	*	*
Finland	✓	✓	*	*
Republic of Ireland	✓	✓	*	*
Spain	✓	✓	✗	✗
Wales	✓	✓	✓	✓

\* Rare, featuring only one or several cases of bilingual signage.

# Sample of bilingual signage

**Crown Vision:**  
Kia māhorahora te reo—  
everywhere, every way, for  
everyone, every day



Figure 11. A rare bilingual warning sign.



Figure 12. Region specific bilingual directional signage.

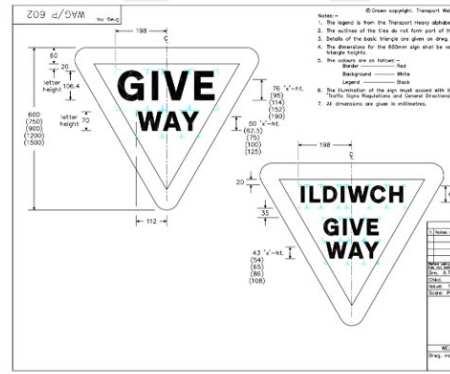


Figure 19. Give way regulatory sign plan.



Figure 14. National road.



# Common drivers

1. Cultural protection
2. Cultural aspiration
3. Safety enhancement
4. Commercial motivation.

- “Against the background of long-running tensions... ***the use of two or three languages on the same traffic board may convey an important message about the status of a language***”.
- Te reo Māori officially classified as ‘vulnerable’ by UNESCO
- Approximately one quarter of Māori people speak and understand Te reo either ‘very well’, ‘well’ or ‘fairly well’.

# The Welsh case

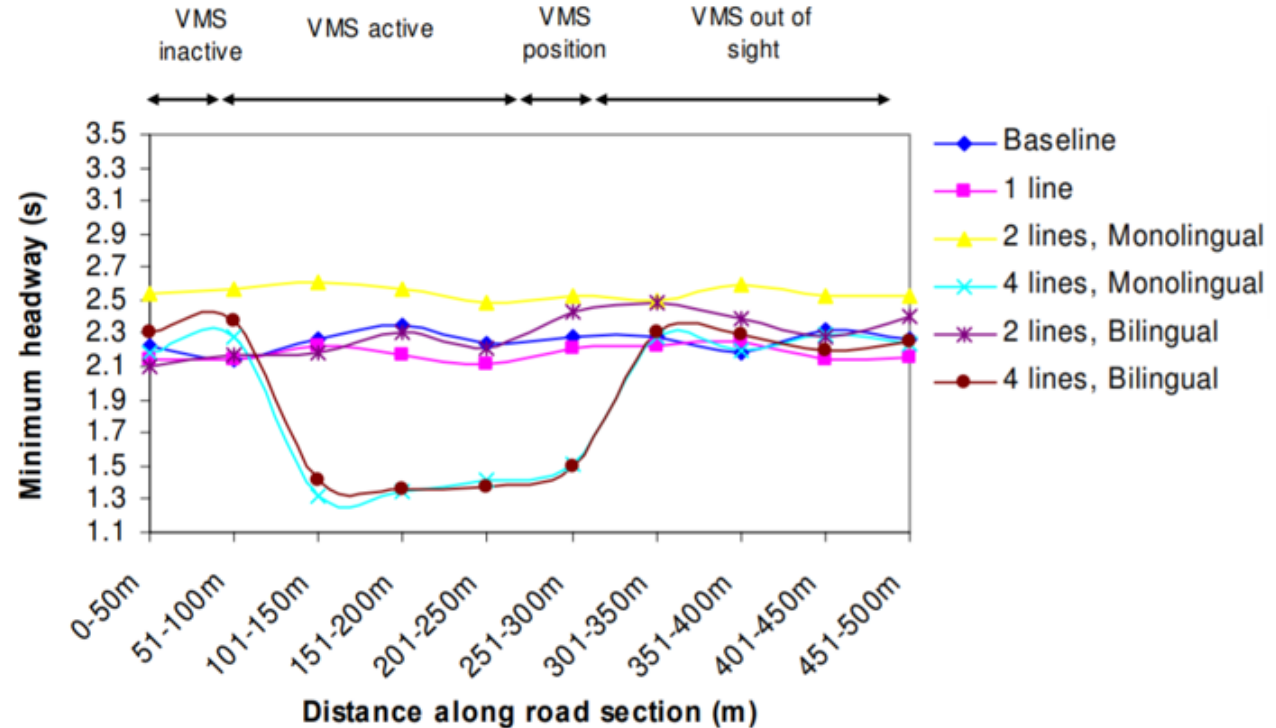
- For proponents the issue was about cultural protection
- Opponents rallied primarily around safety concerns
- i.e., Polarised ‘opposites’ both advocating for the public good.

Figure 1. Cyfeillion yr Iaith (Friends of the Language) demonstrate, April 1971.



# Realistic challenges vs unrealised fears A

1. Complexity
2. Safety
3. Cost.



# Realistic challenges vs unrealised fears B

Performance factors measured	Outcomes observed
<b>Signage comprehension time</b>	Longer with increased sign complexity, bilingual signs, indicating increased cognitive load. Uncertainty and mixed conclusions regarding effect size in real world performance.
<b>Visual attention to signage stimuli</b>	Greater with increased sign complexity and on bilingual signs. Indicate both conscious and unconscious attention is heightened. Uncertain effect on real-world performance.
<b>Following distances while driving</b>	Fell with increased cognitive load, greater sign complexity and on bilingual signs. Indicating distraction and real-world decrements in safety.
<b>Driving acceleration</b>	Rose with increased cognitive load, sign complexity and on bilingual signs. Drivers may compensate for increased comprehension times, and lost time, with less safe driving behaviours. Inconsistent with other research which indicated motor vehicle drivers slow down when signage is complex.
<b>DSI rates</b>	No evidence that DSIs become more frequent on bilingual signage versus comparison routes, although confounds include increase in sign size and new signs in better condition.

# Best Practice Design

## Why traffic signage is different to other types of signage?

- Traffic signage must be:
  - Identified and understood in a **fraction of a second**.
  - Understood by the full **range of people** who travel on NZ's roads.
- Principles of traffic sign design differ from some general signage design guidance.



# Implication of general signage principles

## Complexity

- ↑ information loads → ↓ attention and ↓ reliance on information
  - people draw increasingly on simplified heuristics and pre-existing information for decision-making.
- Highly complex traffic signage can become 'invisible' as road users become overwhelmed by an increase in complexity in an already complex driving-task.

## Cognitive Ergonomic Principles

- Familiarity
- Compatibility
- Standardisation

# Signage “grammar”

- Road users are unconsciously influenced by:
  - Shape
  - Size
  - Colour
  - Icons/graphics
- Text





# Language differentiation and language primacy

- Positive impact of spatial primacy of majority language on comprehension
- Cultural aspiration reasons for indigenous languages to be prime e.g., Wales, Ireland, Finland
- Mitigation by differentiation e.g.,
  - Capitalisation
  - Font types
  - Colour



In France, languages are differentiated using font-type and bold elements



In Greece font-types are identical, but colour differentiation is used



In Scotland colour may be used to differentiate language.



# Signage type

- Place and directional signage are most commonly bilingual
  - less time critical
- Warning and regulatory signage predominantly iconographic and monolingual
  - faster comprehension when reaction times are more critical



National Road, Ireland



Stop and Give way signs, Japan



# Messaging & translation

- Signage complexity and sign length impact comprehension and contribute to performance decrements.
- Keep terms/phrases as short and simple as possible, preferable less than four lines
- Translations must correctly reflect message
- Multiple or contradictory interpretations shouldn't be possible



French – detected



English



Attention: Trous  
d'homme sur  
élèves

Warning:  
Manholes on  
pupils

Bilingual translation errors - Canada

# Summary

Factor	Guidance
<b>Signage 'grammar'</b>	Maintain standardised signage grammar (e.g. background colour, signage shapes and font sizes).
<b>Icons</b>	Where appropriate (e.g. warning signs), maintain familiar, standardised icons (where the shape itself isn't an icon) alongside text.
<b>Text differentiation</b>	Clearly differentiating the two language through at least one variable but ideally more (e.g. different colours and italics). This is particularly important where the two languages share the same script, as Māori and English do, and when the minority language is placed above the majority language.
<b>Message length</b>	Keep the message as short and simple as possible, keeping the number of text lines to less than four.
<b>Consistency</b>	Keep the message standardised across all signage on the network.
<b>Translation alignment</b>	Ensure the translated terminology accurately reflecting the desired message and there is close alignment between the two languages in the message given.
<b>Interpretations</b>	Ensure there are not possible multiple or contradictory interpretations of the translated message.

# Best practice implementation

- Little detail documented on the implementation process
- Inferred: process is different if arisen bottom up or top down
- Risks may delay, derail or distract from best-practice design or implementation

## Risks

- Misaligned public interests – avoidable conflict
- Financial risks – depends on implementation strategy, worse if not best practice design
- Erroneous performance assessments – methods not fit for purpose



Regional Road, Ireland

# Implementation plan could include...

- **Stakeholder engagement** – addresses values, preference, concerns
- **Iterative design process** – incorporates best practice, mitigates concerns
- **Parallel development of legislation and standards** – change to TCD rule
- **Pragmatic budgeting** – e.g. all at once or on replacement
- **Targeted communication** – give reasons, diffuse tension, take on journey
- **Ongoing monitoring** – design plan in advance

# Opportunities and next steps

- Translation
  - Accredited Te Reo Māori translator,
  - Iwi representatives,
  - The Te Reo Māori entities Te Mātāwai and Te Taura Whiri (Māori Language Commission),
  - Te Mātangi – Waka Kotahi Māori Partnerships Team and other Waka Kotahi staff.
  - National and regional bodies
  - Professional cultural advisors
- Monitoring – methodology for reviewing impact, including on safety, usability, cultural awareness.
- Policy – change to the Land Transport Rule Traffic Control Devices 2004 Rule 54002/2004.
- Education and engagement – Pro-active – manage knowledge, expectations, public perceptions of risks.
  - Initial negative perceptions will diminish as the use of Te Reo Māori on traffic signage is normalised.

# The international experience

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**Thank you!**

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# Insight on out of scope questions

- **What words and phrases could be used and, how might national consistency fit with appropriate local expression?**
  - Keep terms/phrases as short and simple as possible
  - Shapes, colours, terminology should be consistent across the network
- **What are the best mechanisms for using and representing Te Reo Māori on road side infrastructure and in road safety messaging?**
  - Other options for roadside signage include billboard signage and other types of advertising signage described in Part 3 of the TCD Manual.
  - There is no restriction that prevents the use of Te reo Māori in this type of signage.

# Proposed Workstreams

## Bilingual Traffic Signage

Policy Rule  
Change

Translation

Research

Design &  
Implementation

Communication  
Engagement

# Proposed Marae Signage

No motif

Concept 1a



Niho taniwha

Concept 1b



Flax weave

Concept 1c



Poutama

Concept 1d



Patiki

Concept 1e



Concept 2a



Concept 2b



Concept 2c



Concept 2d



Concept 2e



Concept 3a



Concept 3b



Concept 3c



Concept 3d



Concept 3e



Note: Some of the concepts include our name Waka Kotahi to illustrate where and how the name of the marae will be depicted on the actual sign. The name Waka Kotahi will be replaced with the name of the marae. In some circumstances it may not be possible to include the name of the marae on the sign, where that name has many letters i.e. the more letters, the smaller the font and the more difficult to comprehend the name. In those circumstances the word Marae may suffice. This will need to be agreed with the marae.