

How to take a Systems approach

Hamish Mackie, Trafinz 2023



Agenda...

Approaches we have found useful...

Other peoples approaches or problems/opportunities

Discussion of ideas to move forwards

Unblockers

What works for us...

1. Understand
your System

Define system and goals
Framework and methods
Actors and connections
Considering system dynamics

2. Find pain and
leverage points

Identify key parts of the system
More upstream?
More connection/influence points?
Strong evidence of system failure
Areas where change is possible

3. Deep dives and
Take Action

Interrogate how pain point is behaving
Support with further evidence
Identify areas for action

Discussion

What are your system questions?

What has worked for you?

Progressing system thinking in transport

Opinion: Reducing speed limits is a cop-out



By [John MacDonald](#)

15 Nov, 2022 12:52 PM 3 mins to read

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Waka Kotahi has opened a consultation on an Interim State Highway Speed Management Plan aimed at making New Zealand's highways safer. Photo / Christchurch City Council

OPINION

If we can be thankful for anything today, it's the fact that Waka Kotahi isn't in charge of aviation.

Change is hard



A Better Te Awamutu & Surrounding Areas Grapevine



Stickers Tim · 19h ·



Supplied by
Lisa Amundsen

The opportunity

Political and organisational leadership



Planning, investment, capability



Delivery of safer, healthier, lower-carbon transport

The opportunity

Political and organisational leadership



Planning, investment, capability



Delivery of safer, healthier, lower-carbon, transport

SYSTEM

Needs System Thinking

AHEAD

Unintended
slide

1989/90 travel to school

19% of secondary school children biked

12% of primary school children biked



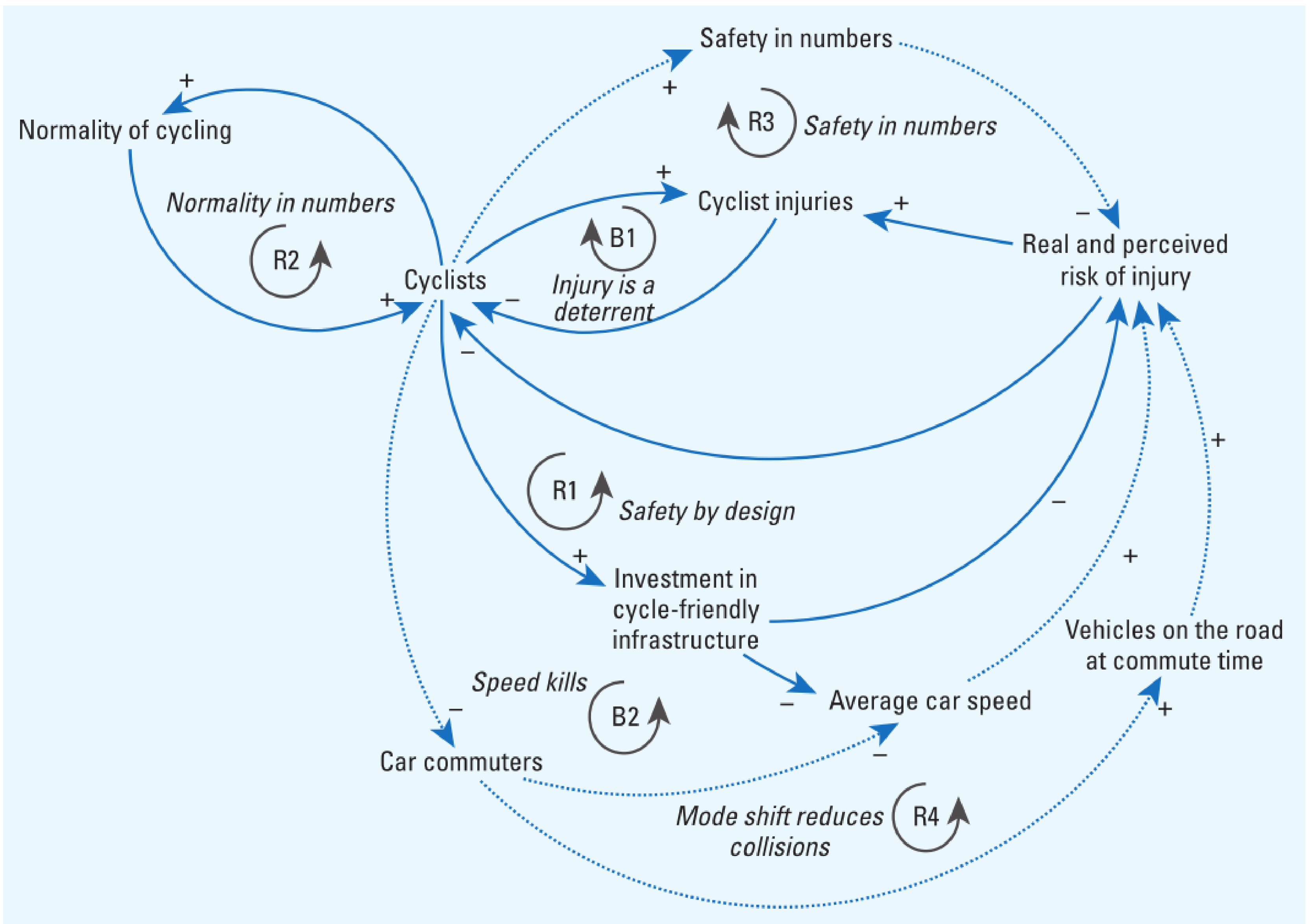
2010-2014 travel to school

3% of secondary school children biked

2% of primary school children biked



https://www.reddit.com/r/lowcar/comments/ont9ys/new_zealand_1970s_bike_stands_at_burnside_high/



Macmillan, A, J Connor, K Witten, R Kearns, D Rees and A Woodward (2014) The societal costs and benefits of commuter bicycling: simulating the effects of specific policies using system dynamics modeling. *Environmental Health Perspectives* 122, no.4: 335.

The 'why' behind the Safe System

Societal 'landscape'



Policy, rules



Organisational arrangements



Ways of working and delivery



Roads and roadsides

Speed

Road users

Vehicles



Systems Thinking

Goal – overall purpose of system

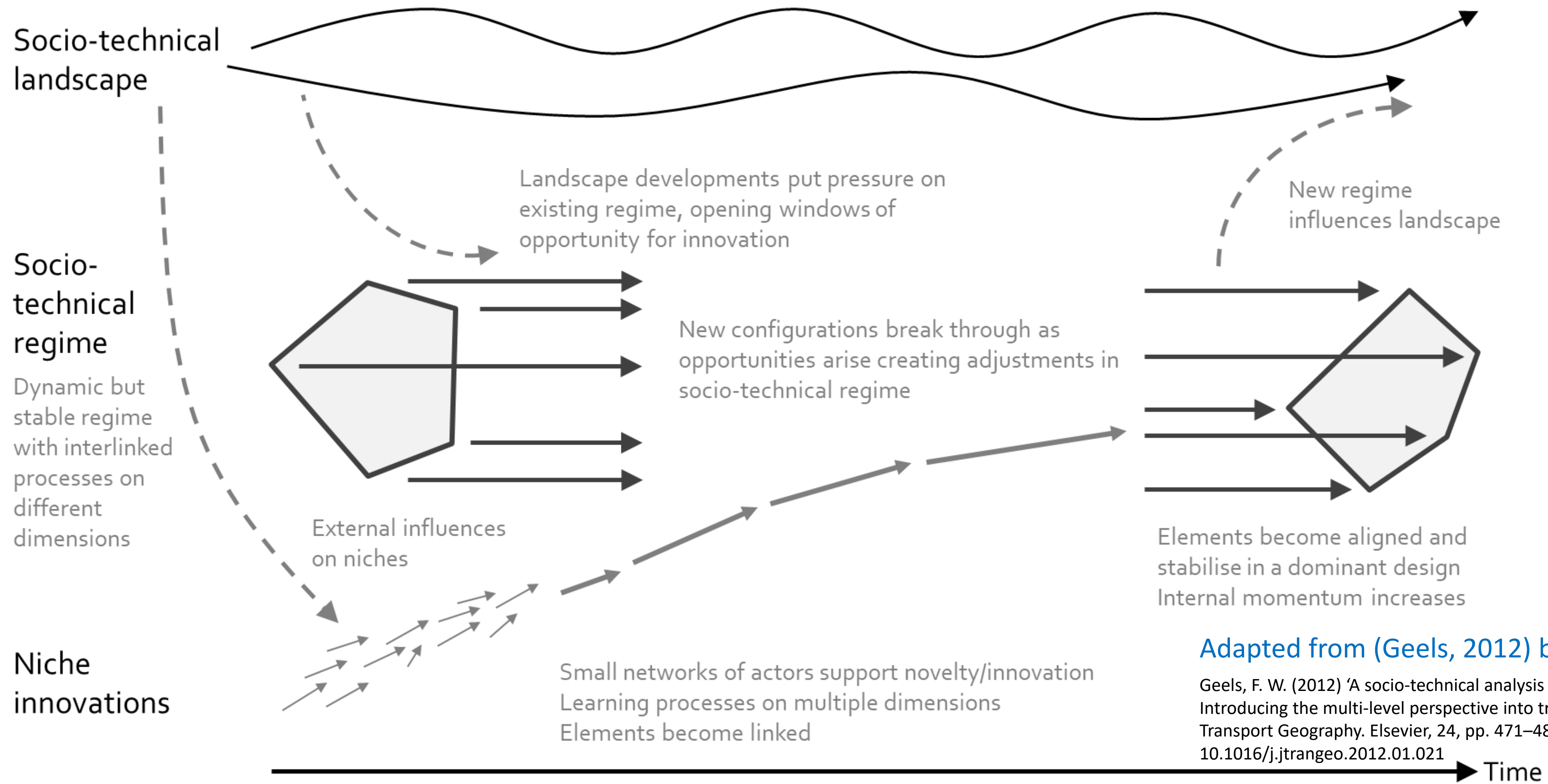
Structure – components, actors, boundaries

Connections – how components/actors inter-relate

Movement – the dynamic and non-linear nature of systems

System change: shifting norms, values, habits, mental models, ways of working and....outcomes

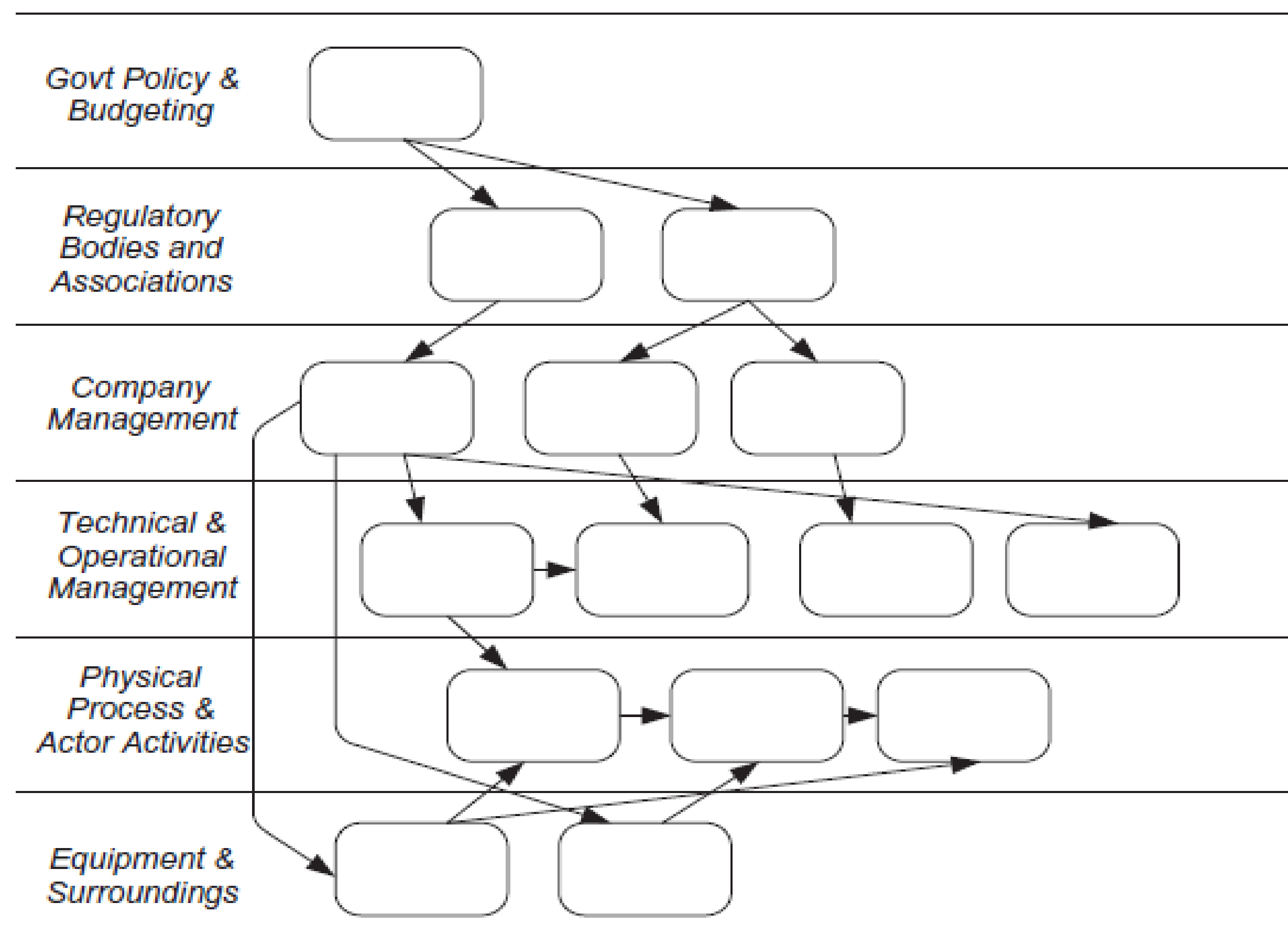
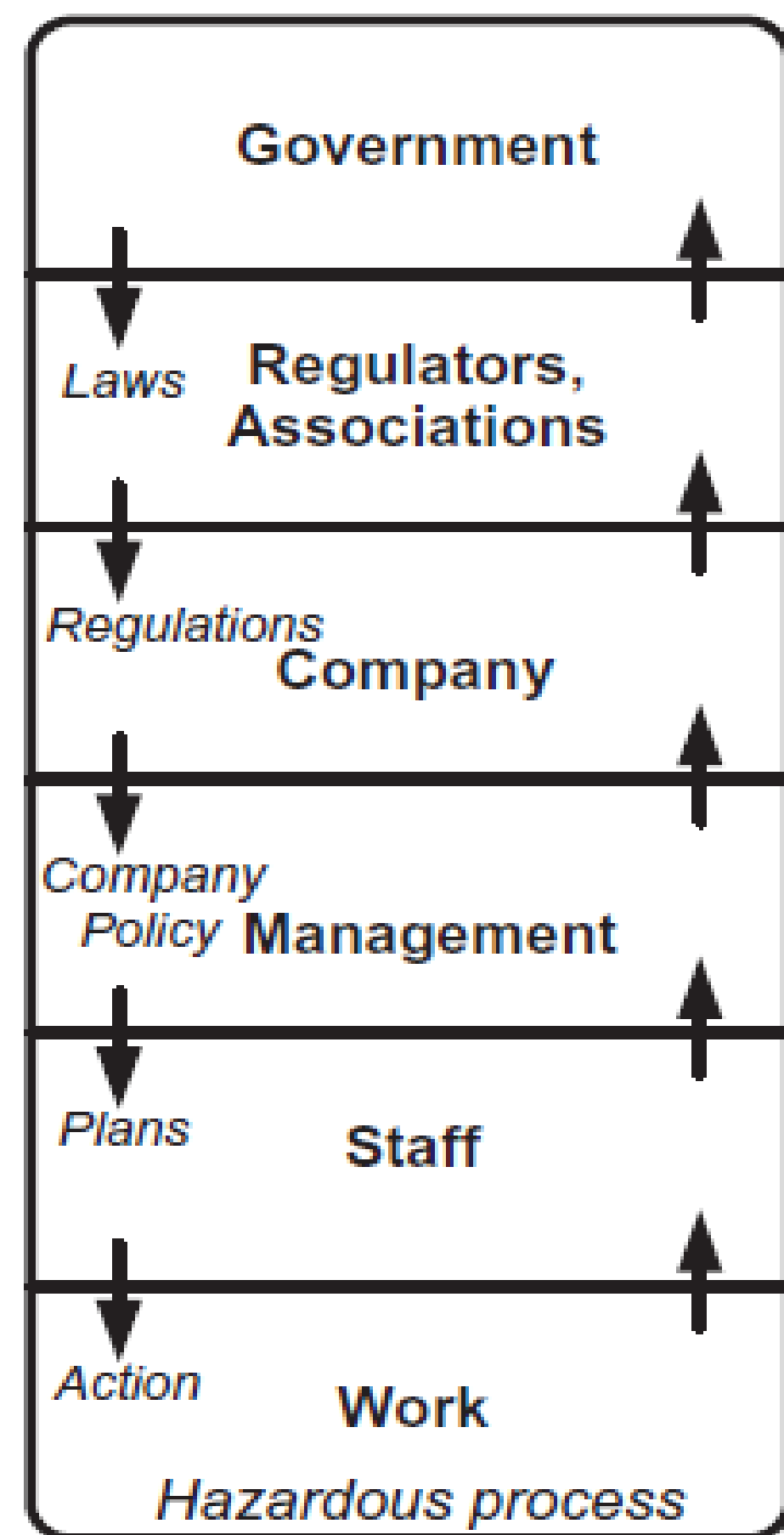
Sociotechnical systems and niche Innovations




Adapted from (Geels, 2012) by Field 2018

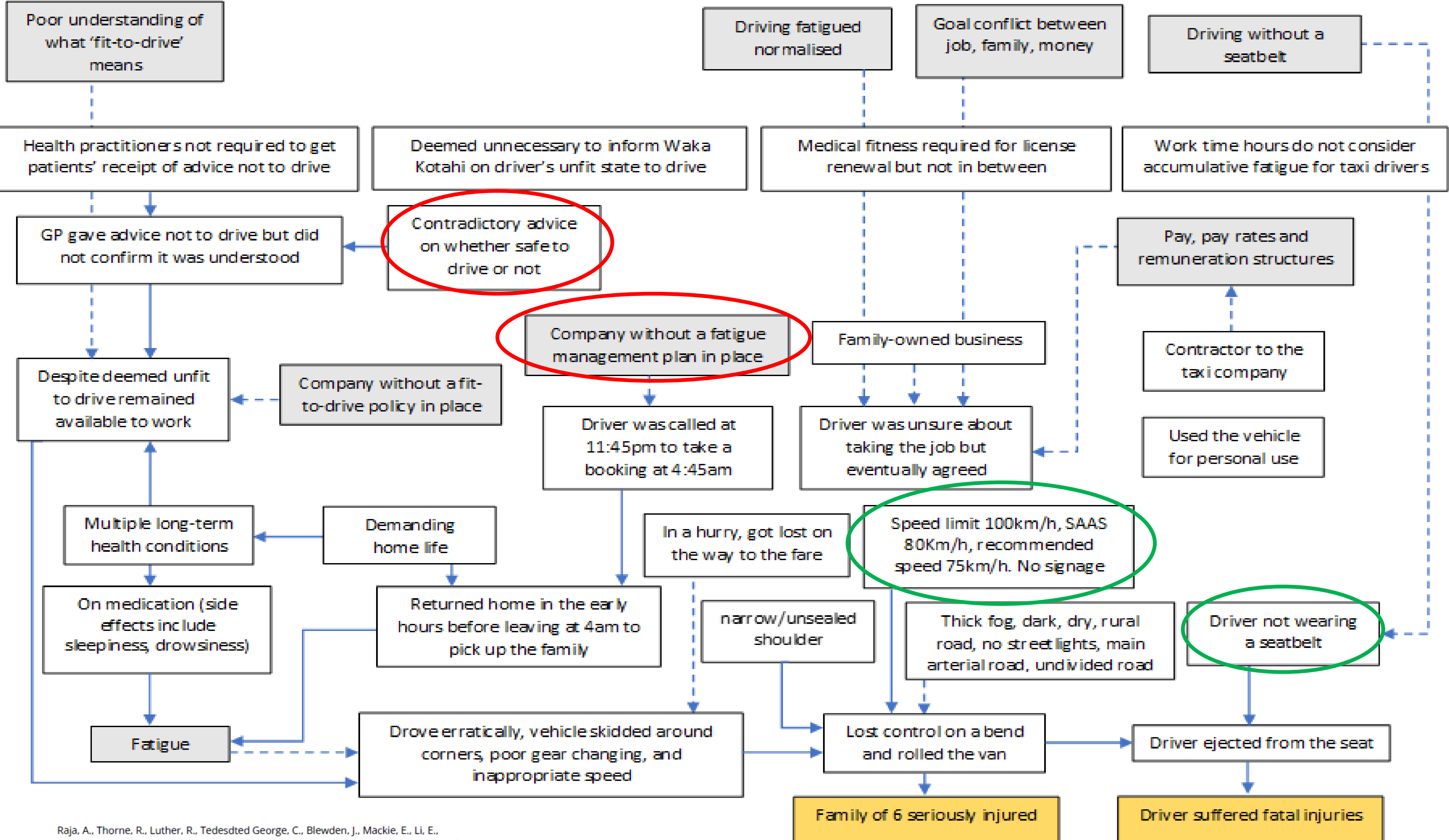
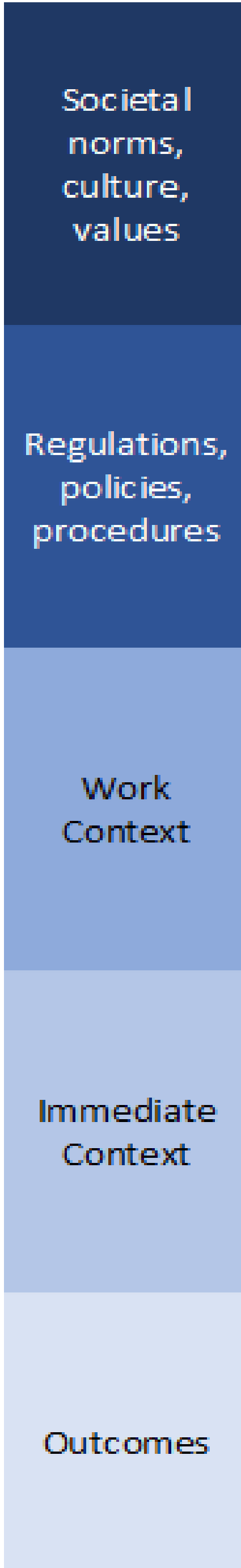
Geels, F. W. (2012) 'A socio-technical analysis of low-carbon transitions: Introducing the multi-level perspective into transport studies', *Journal of Transport Geography*. Elsevier, 24, pp. 471–482. doi: 10.1016/j.jtrangeo.2012.01.021

Rasmussen's model of socio-technical complex systems



 = Failures, decision, actions etc

Source: Salmon et al (2012)



Raja, A., Thorne, R., Luther, R., Tedesdted George, C., Blewden, J., Mackie, E., Li, E., Mackie, H., & Douglas, S. (2023). Driving for Work Crashes: A Systems Analysis. *Journal of Road Safety*, 34(3). <https://doi.org/10.33492/JRS-D-22-00049>



THE SOCIO-TECHNICAL SYSTEM OF RAPID STREET SPACE REALLOCATION

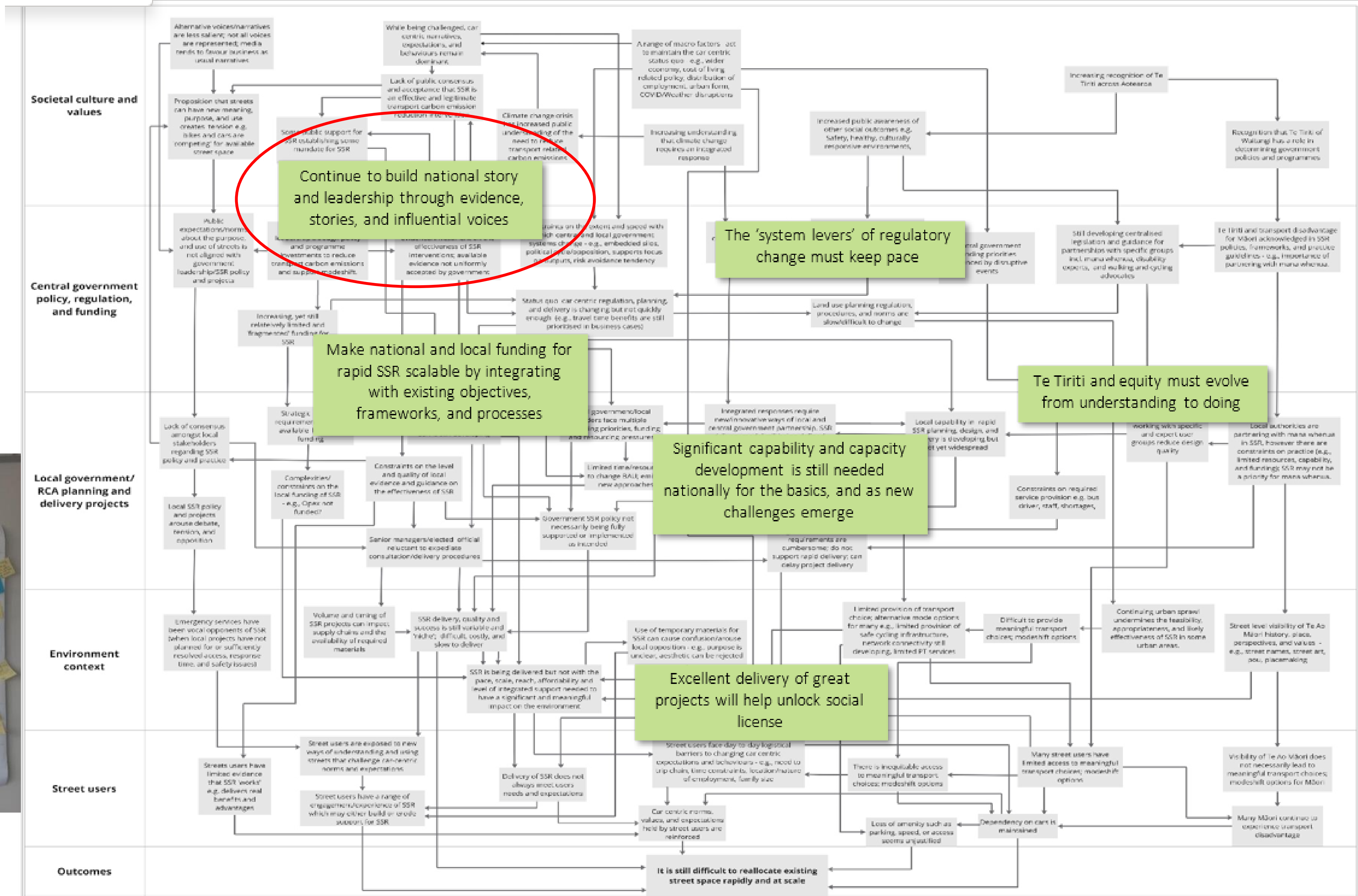
Kat Gilbert | Michael Blewden | Hamish Mackie | Sienna MacArthur-Beadle

27 APRIL 2023



Key moves required to make progress

it last modified: 6 June



Society

Dominant **BAU** narratives

Real public sentiment

Government

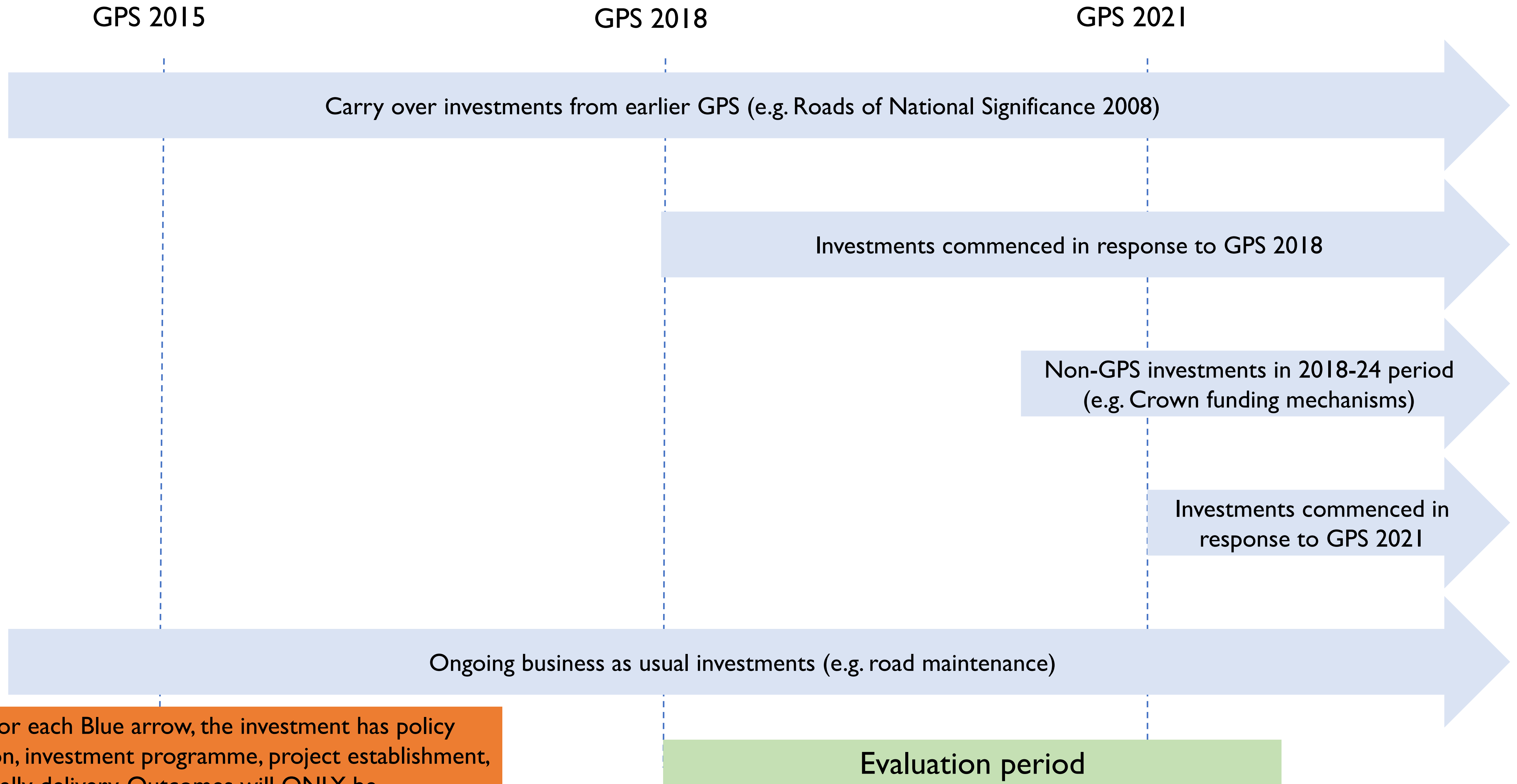
Challenging leadership environment

Lack of **public facing** plan/story/evidence /mandate

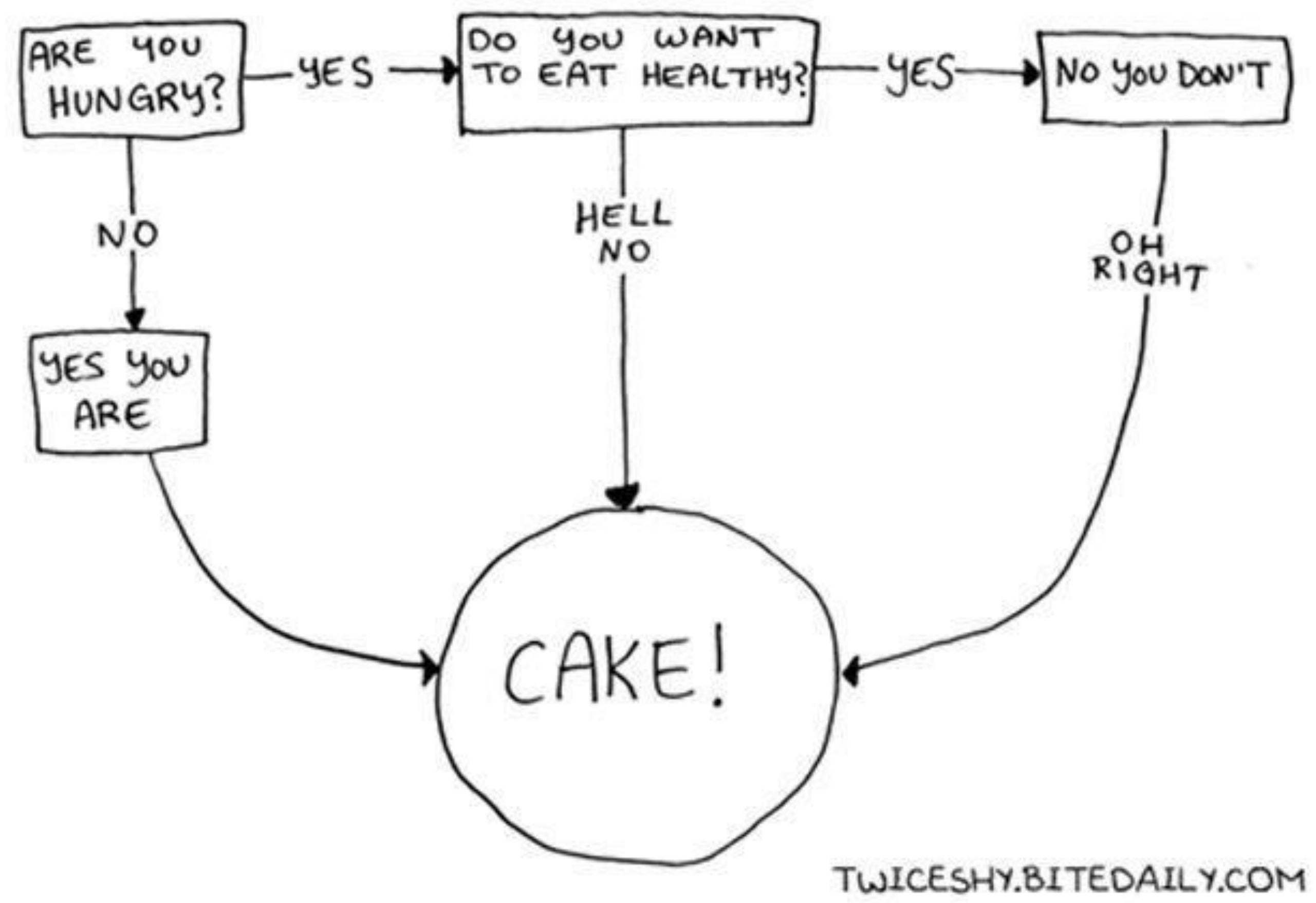
Committed existing funding prevents change investment

Lack of **change** investment and delivery

GPS 2018 context



Note for each Blue arrow, the investment has policy direction, investment programme, project establishment, then finally delivery. Outcomes will ONLY be experienced following delivery.



Thank you!