

Business Case Analysis

ENGGEN 403 - Lecture 13

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UNIVERSITY OF
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Waipapa Taumata Rau
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ENGINEERING

Learning Outcomes



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By the end of this session, students should be able to:

- Discuss the most important aspects of a business case in the context of Government projects and mega projects.
- Describe the logical flow between the different stages of a business case
- Be able to write a business case linking the problem space to the solution space and then to the implementation plan
- Carry out initial options assessment using the critical success factors

Lecture Outline



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1. What's coming up this week
2. Business case at the systems level (Better Business Case)
3. Business Case Methodology
4. Business Case Structure

Cases: Golden Mile, Auckland Light Rail

This Week

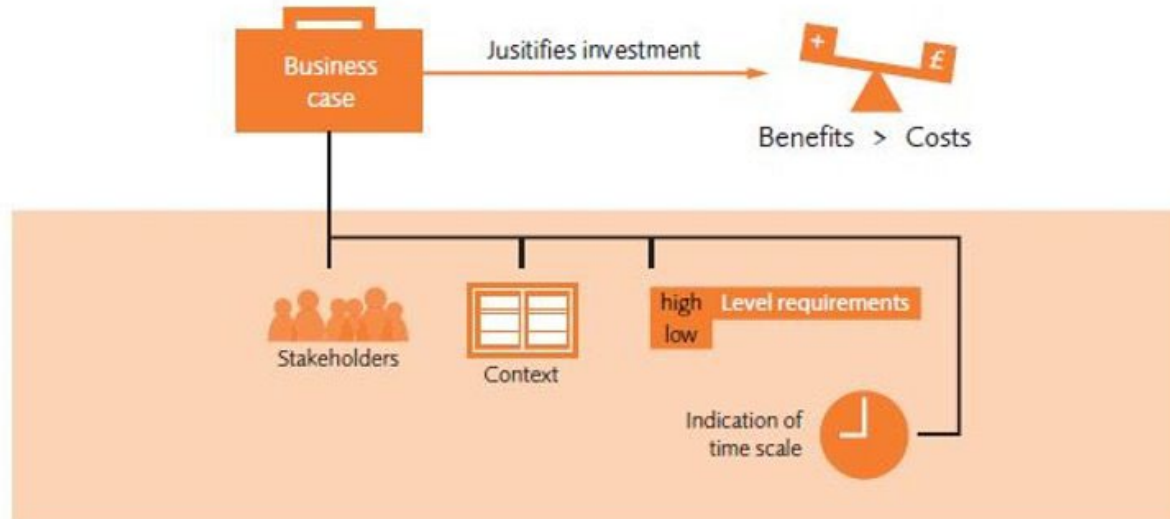
4	5 Aug	Social CBA	Guest Speaker: Dame Prof Juliet Gerrard	Meet the Team	Lecture Participation Team Canvas
5	12 Aug	Business Case Analysis	Research and Resources	Introduction to Team Project	Quiz 2
6	19 Aug	Team Project Q&A	Team Project Q&A	Team Project Q&A	Team Project

Quiz 2: Opens Thursday 1pm – Closes Friday 10pm

- Assesses lectures 8-13
- Check out the Quiz 2 resource page on canvas.

Business Cases

A business case provides justification for undertaking a project. It evaluates the benefits, costs and risks of alternative options and presents the rationale for the preferred solution. Its purpose is to obtain management commitment and approval for the investment or funding.



Business cases can be done at all levels!

ENGEN 204/303

B2C

B2B

Simple problems

ENGEN 403

B2G

Wicked Problems

Government Projects

While simple projects only require a single stage business case, complex Government projects over \$25M NZD or deemed high risk, require a two-stage cabinet approval process called the **Better Business Case**.

Stage 1 - Indicative Business Case

Why is the project needed?

What are the options?

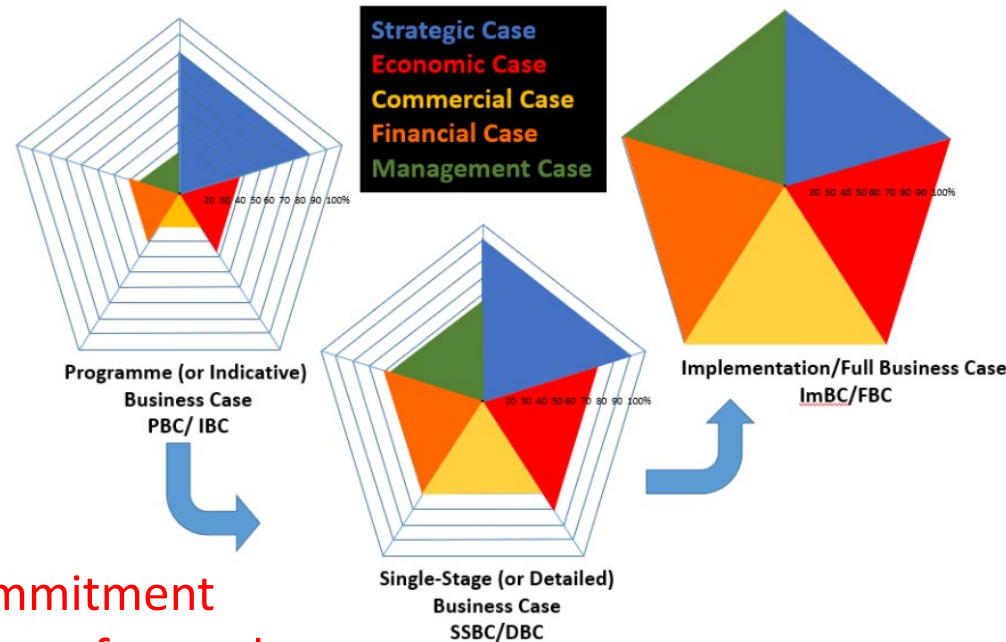
Stage 2 - Detailed Business Case

Moving forward with the preferred option

Proceeds to tender offer

If approved, create full implementation business case

Allows for 3 'offramps' to avoid overcommitment and reduce losses if project does not move forward



Industry Cases



Auckland Light Rail Indicative Business Case



Golden Mile Detailed Business Case

The Treasury is The Government's lead economic and financial advisor and provides strategic policy advice on the New Zealand economy.



We provide advice to the Government on its overarching economic framework, on its fiscal strategy and on achieving value for money from its investments. We implement Government decisions and are also responsible for the Financial Statements of the Government, for ensuring effective management of the assets and liabilities on the Crown's balance sheet, and for publishing economic and fiscal forecasts.

Is one of the 5 central agencies, alongside.

- Department of the Prime Minister and Cabinet
- Public Service Committee
- Ministry for Regulation
- Social Investment Agency

Our key business objectives are:

- fiscal, monetary and regulatory frameworks result in a stable and sustainable economic environment
- the Crown's finances and the financial and non-financial balance sheet are managed efficiently, effectively and sustainably, and
- institutional and regulatory settings support the state sector system to increase equitable, intergenerational wellbeing for New Zealanders.

Check out how are public sector is structured [here](#)

NZ Better Business Case



Strategic case

- Project background
- Problem spaces
- Stakeholder analysis
- Requirements and KSFs
- Assumptions and constraints

Economic Case

- Long list options assessment
 - DFV
 - Problem statements and KSFs
- Shortlisted option justification

Financial Case

- Economic / social impact assessment
- Preferred way forward

Management Case

- Implementation plan and timeline
- Outcomes and measures of success

Recommendations

1. Define and analyse a **problem**
2. Identify the **users/stakeholders**
3. Figure out the **requirements** of the users/stakeholders
4. Select the **key success factors (KSFs)** that a solution must meet
5. Come up with different **options** that are potential solutions to the problem
6. **Assess** those options against the DFV, KSFs and problem statements and determine the **shortlist**
7. Carry out **economic analysis and societal impact** of the shortlisted options
8. Determine which option creates more **value** and suggest it as the best **way forward**
9. Define a **plan to implement** it

2 Background Golden Mile

The Golden Mile Project forms part of the LGWM programme. This programme is a joint initiative between Wellington City Council (WCC), Greater Wellington Regional Council (GWRC) and Waka Kotahi NZ Transport Agency (Waka Kotahi), with support from mana whenua partners Taranaki Whānui and Ngāti Toa.

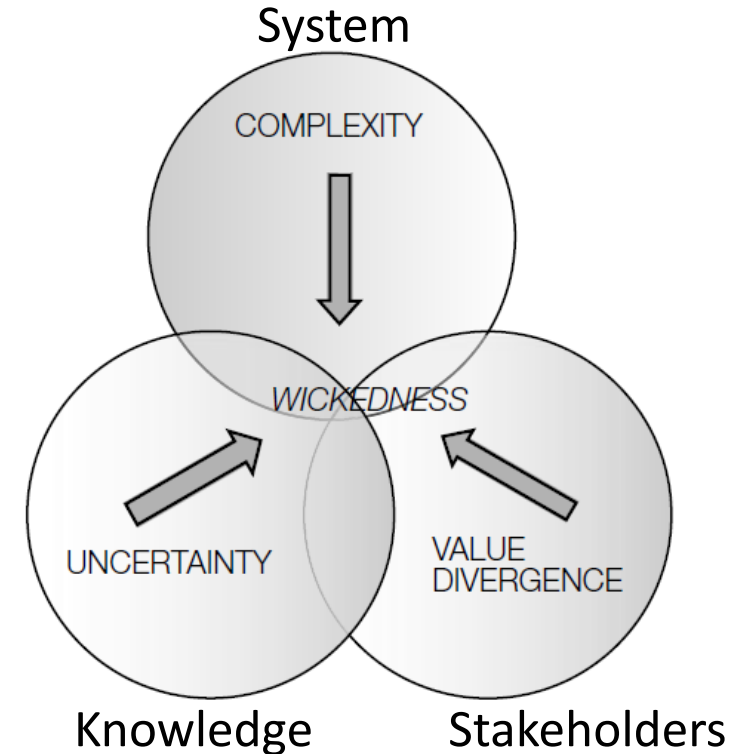
The geographical scope for the LGWM programme covers the area from the Ngauranga Gorge to the Wellington International Airport, encompassing the Wellington Urban Motorway and connections to the central city, Wellington Hospital and the eastern and southern suburbs.

BACKGROUND Auckland Light Rail

Work on a rapid transit solution for the CC2M corridor has gone through many iterations in recent years, starting with an Auckland Transport proposal which sought to address increasing bus congestion in the city centre, and later versions led by Waka Kotahi.

In 2020, the Ministry of Transport, with the support of the Treasury led a collaborative exercise with Auckland Transport Alignment Project (ATAP) partners, Ministry of Housing and Urban Development (MHUD), Kāinga Ora and the Infrastructure Commission (Te Waihanga) to develop advice to the incoming government.

- Problems at systems level
- Root cause analysis
- Five Whys
- Mind mapping
- Trend mapping
- Data to support insights into the problem
- Multiple problem statements at the systems level



Problem Statements

Table 13: Golden Mile Problem Statements²⁹

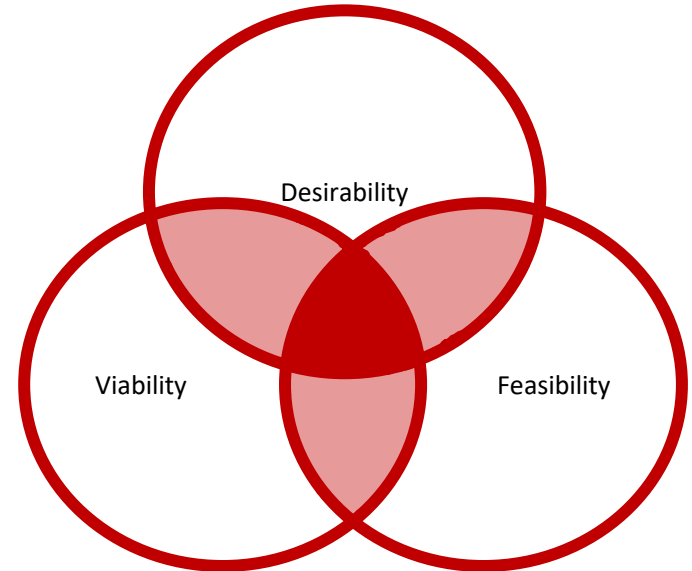
Problem Statements	Weighting
Problem 1 Slow and unpredictable bus travel times reduce the attractiveness of travel by bus	50%
Problem 2 Inadequate provision for pedestrians along and across the Golden Mile reduces convenience of walking	30%
Problem 3 Street layout limits the attractiveness of the Golden Mile as a place in which to spend time and move through	20%

Can have multiple
problem statements
→

Provides a framework to quickly screen long list options.

- **Desirability** – how much is the option desired (demand)
- **Feasibility** – is the option technologically possible?
- **Viability** – is the project financially viable?

Quickly screens the 'out the gate' options that are likely not possible



Stakeholders

Recall Amandas lecture from last week



Who is the client?



Who is designing?
Who is manufacturing/constructing?



Do we need regulatory permissions?



Who are the end users?



Who is funding?



Who will
distribute/operate?



Do we need cultural permissions?

Anyone else?

Key Stakeholders / Partners

- Wellington City Council
- Greater Wellington Regional Council
- Waka Kotahi
- Taranaki Whānui, Ngāti Toa

Consider your own stakeholder engagement plan

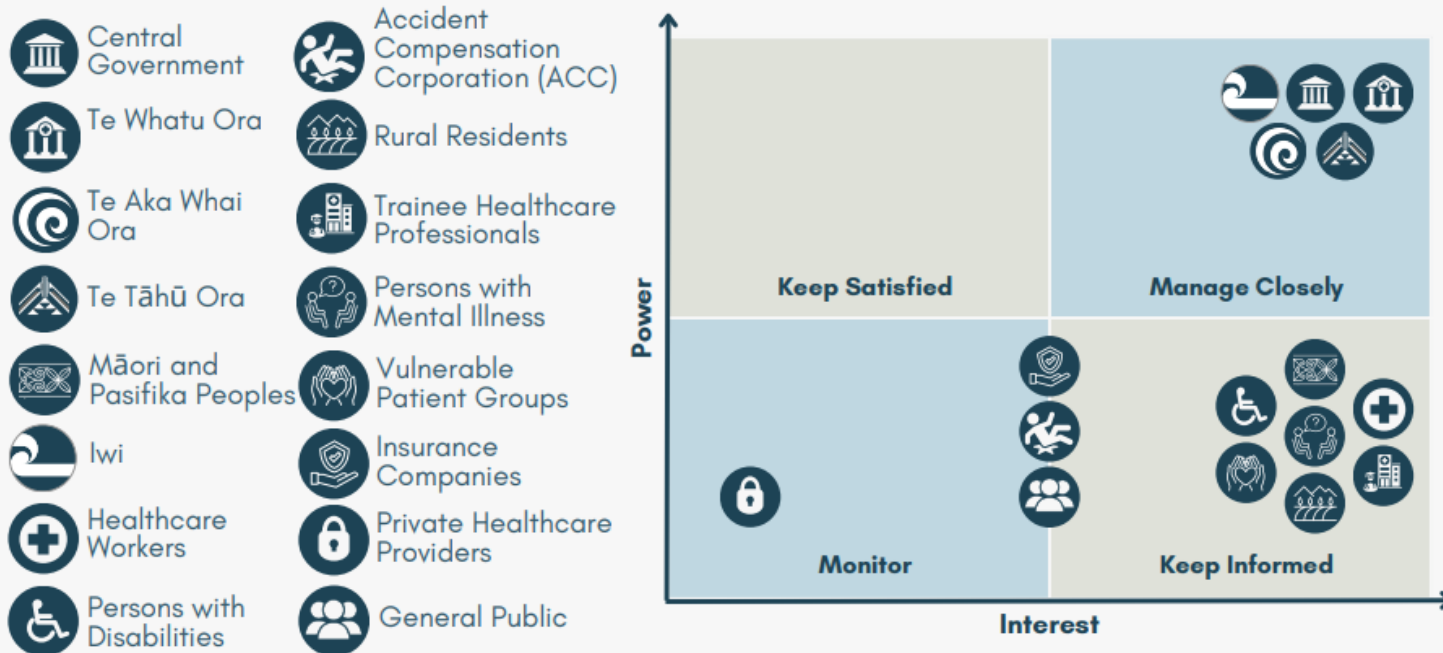
- What stakeholders are important?
- Best communication methods?
- How informed or satisfied do they need to be?
- Be specific!

Other Key Stakeholders

- Wellington Chamber of Commerce
- Retail NZ
- Hospitality NZ
- Retail businesses (Golden Mile general)
- Hospitality businesses (Golden Mile general)
- Businesses general
- Inner city residents (all)
- Cycle Aware (Wellington)
- Living Streets Aotearoa
- AA Wellington
- ACC Accessibility Advisory Group
- Taxis and rideshare companies (all)
- Commercial road users – Heavy Haulage, Road Transport Forum (RTF), Road Transport Association (RTA)
- NZ Police, and
- Utilities (all).

1.3 STAKEHOLDER ANALYSIS AND KEY REQUIREMENTS

The Power-Interest model (Figure 1) was used to identify the level of interest and power of each relevant stakeholder. Relevant stakeholders are listed below.



Previous Systems Project



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Key Stakeholders	Necessary	Nice-To-have	Aspirational
Central Government	<ul style="list-style-type: none"> Quality of healthcare is not reduced. 	<ul style="list-style-type: none"> Local government policies are adhered to. Systems used across governing organisations are consistent. 	<ul style="list-style-type: none"> Budgeted costs do not increase.
Iwi	<ul style="list-style-type: none"> Te Tiriti requirements are upheld. 	<ul style="list-style-type: none"> Solutions are implemented with consultation of Iwi. 	
Te Aka Whai Ora	<ul style="list-style-type: none"> Māori communities are better served. The requirements of Te Tiriti are met. 	<ul style="list-style-type: none"> The number of Māori healthcare professionals increases. 	
Te Whatu Ora	<ul style="list-style-type: none"> Equity of health outcomes for patients is improved. Existing processes are streamlined. 	<ul style="list-style-type: none"> Health outcomes and patient satisfaction are improved overall. Systems used across governing organisations are consistent. 	<ul style="list-style-type: none"> There is no difference in the availability and accessibility of medical care regardless of location.
Te Tāhū Hauora	<ul style="list-style-type: none"> Health outcomes and patient satisfaction are improved. Healthcare service standards are improved. 	<ul style="list-style-type: none"> Data and reporting is made more transparent. All communities/population groups benefit. 	
Healthcare Workforce	<ul style="list-style-type: none"> Working conditions and work life balance are improved. Associated occupational hazards are not increased. 	<ul style="list-style-type: none"> Healthcare worker retention is improved. Systems used across governing organisations are consistent. 	<ul style="list-style-type: none"> The number of opportunities for professional development are increased.
Māori and Pasifika Peoples	<ul style="list-style-type: none"> Healthcare services culturally sensitive. Language is not a barrier to receive healthcare. Cost does not inhibit medical care. 	<ul style="list-style-type: none"> Incorporate The Whare Tapa Whā and Fonofale model of Hauora (wellbeing). 	

Key Success Factors

Critical success factors

There are a number of success factors to achieving urban development outcomes, which include:

- development programme ownership and intentional delivery
- a “whole of government” collaborative approach to securing urban outcomes
- contextual and place-based application (“Inside out”)
- strategically and spatially informed transport - urban investment options (“Outside in”)
- giving regard to the respective competencies, risk profiles and frameworks which govern the activities of the Delivery Entity or responsible partner organisation
- enabling market attractiveness to secure private sector involvement
- coordinated rollout of intensification opportunities
- utilising a suite of intervention instruments
- clear programme, accountabilities, budget, performance monitoring and reporting requirements.

In the APB & B Study of 2010⁴⁶ four potential transport investment alternatives were analysed on a qualitative basis:

- on-surface bus capacity improvements
- a central area bus tunnel with three stations
- an expanded Britomart rail station
- a City Centre rail tunnel with three stations (CRL).

Multi-criteria analysis was used to reduce the list of four alternatives down to two options capable of providing the capacity, reliability and robustness to deliver the transport outcomes sought. The City Centre of 2041 was anticipated to need a solution that could provide additional transport capacity without causing congestion and other environmental externalities.

The two higher scoring options were the CRL with three stations and the Central Area Bus tunnel with three stations with the former preferred for its higher cost effectiveness.

You should establish your longlist options then use KSF's and alignment with problem statements to narrow

Initial Options Assessment

Longlist Option	CSF 1	CSF 2	CSF 3	CSF 4	CSF 5	Viability	Feasibility	Desirability
Do nothing	Yellow	Yellow	Red	Red	Green	Green	Green	Red
Reflux valves	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Green	Green
Reshape terrain	Yellow	Green	Yellow	Yellow	Red	Red	Red	Red
Permeable surfaces	Green	Yellow	Green	Green	Green	Yellow	Green	Green
Storm surge barriers	Yellow	Green	Green	Green	Green	Yellow	Green	Red
Reclaimed land	Green	Green	Red	Green	Red	Red	Green	Green
Managed retreat	Green	Green	Red	Yellow	Yellow	Yellow	Green	Red
Reservoir	Green	Green	Green	Green	Yellow	Green	Green	Green
River modification	Green	Green	Green	Green	Yellow	Green	Yellow	Yellow
Seawalls/stopbanks	Green	Green	Green	Green	Green	Green	Green	Orange
Coastal reinforcement	Green	Green	Green	Yellow	Red	Green	Green	Yellow
Floodplains	Green	Green	Green	Yellow	Red	Yellow	Green	Green
Storm protection in houses	Yellow	Green	Red	Yellow	Green	Green	Green	Green
Mangroves/Trees	Green	Green	Yellow	Green	Green	Green	Green	Orange
Marina Barrage	Green	Green	Green	Yellow	Yellow	Red	Green	Green

Options Assessment - Golden Mile

Following completion of the Golden Mile Public Engagement Programme in 2020, a multi criteria analysis (MCA) process was undertaken to evaluate / score the three short listed options. In summary this process involved subject matter experts undertaking qualitative evaluations (where possible) and scoring (on a 7-point scale) each short-listed option

Common and Contrasting														
Pedestrian Safety	0	1	0	2	0	1	1	1	0	1	0	1	0	2
Pedestrian Capacity	0	1	2	2	0	1	1	2	0	1	0	1	2	2
Improve Place quality	0	0	1	3	0	1	1	1	0	0	0	0	1	3
Effects														
Social	0	0	1	3	0	1	2	3	0	0	0	1	2	3
Retail Impacts	0	1	1	2	0	1	1	2	0	0	0	1	1	1
Cycling Level of Service	0	1	1	3	0	0	0	-1	0	-1	0	1	1	3
General (Road) Safety	0	1	1	2	0	1	1	1	0	1	0	1	1	2
Sustainability	0	1	1	3	0	1	1	3	0	0	0	1	1	3
Fit with LGWM Programme	0	0	3	3	0	-1	-1	-1	0	0	0	2	3	2
Delivery, maintenance, and operations														
Delivery	0	-1	-1	-2	0	-1	-1	-2	0	-1	0	-1	-1	-2
Operations and Maintenance	0	-1	-2	-3	0	-1	-2	-3	0	-1	0	-1	-2	-3
Timeframe for Delivery	0	2	2	2	0	2	2	2	0	2	0	2	2	2
Final scores and rankings														
Total scores	0	8	15	23	0	8	9	12	0	4	0	12	16	22
Final rankings		3 rd	2 nd	1 st		3 rd	2 nd	1 st		All Options		3 rd	2 nd	1 st

Short-List Options



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Concept One: “Streamline”
(i.e. Short Listed Option 1)



Concept Two: “Prioritise” (i.e. Short Listed Option 2)

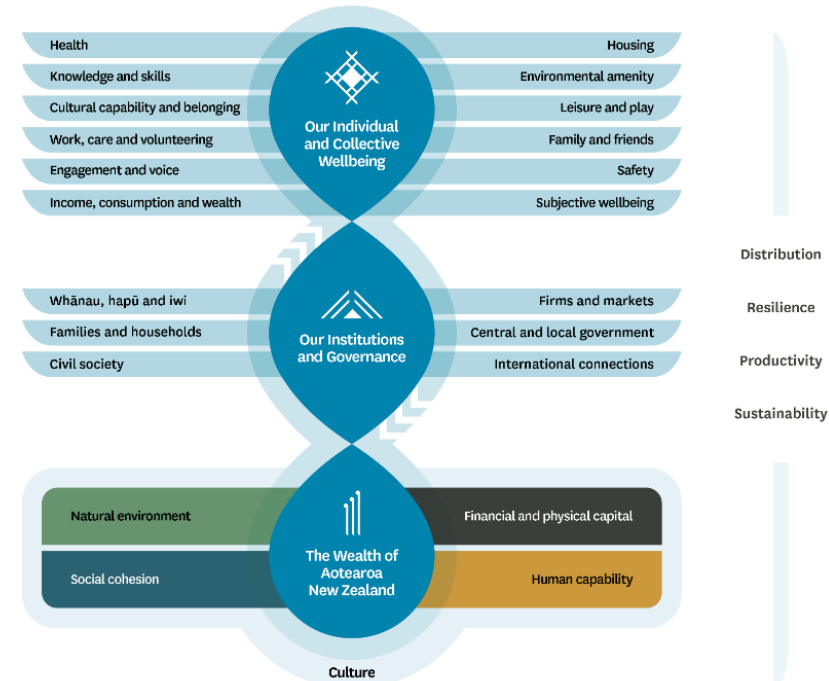


Concept Three: “Transform”
(i.e. Short Listed Option 3)



- With a small number of options, it is possible to do a more detailed analysis
- Answers the question, is this solution economically viable? Are the economic benefits larger than the costs? How does it compare to the other options?
- Monetise the biggest impacts through CBAX
- Quantitative (CBA) and Qualitative (MCA) analysis
- Explain your assumptions!

The Treasury's Living Standards Framework



- Value is not just economic
- What is the impact of the solutions on the wider society?
- Living Standards Framework
- Impact on the 4 Capitals (Lecture 11)

Economic and Social Impact Assessment

Cost / Benefit	Present Value (\$M)
Costs	
Construction costs	\$80
Maintenance costs	\$6
Total costs	\$86
Benefits	
Car travel time impact	-\$20
Emission reduction benefit	\$17
Health benefit from mode shift (car to public transport)	\$48
Public transport travel time impact	\$17
Public transport reliability impact	\$27
Pedestrian travel time impact	\$25
Pedestrian crash reduction benefit	\$37
Pedestrian realm benefit ³	\$247
Total benefits	\$399
Net benefits	\$313
Benefit-cost ratio (base)	4.6
First year rate of return	0.11

	Do Nothing	Package 1 - Mobile	Package 2 - Healthline
Cost (\$M)	0	368	421
Benefits (\$M)	-51,705	1,610	1,869
Cost Benefit Ratio	N/A	4.37	4.44
Natural			
Human			
Social			

Previous Systems Project

Golden Mile



Preferred Way Forward



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- Which shortlisted option creates more value? Economic and social
- Your choice must be logically explained and must make sense.
- Also consider how this plan would fit into a wider programme or long-term strategy.
- Now you can define the scope and move to implementation.

Overall, Option 3 was ultimately identified through the MCA process as the best performing option for Lambton Quay, Willis Street and Courtenay Place (and the “All options” option was considered the best performing option for Manners Street). Option 3 was subsequently endorsed by the LGWM Board, and publicly announced as the preferred investment option for the Golden Mile Project in June 2021.

It is noted that significant benefits are expected to be generated by the combined pedestrian travel time, crash reduction and pedestrian realm benefits. Analysis shows that most of these benefits will occur on Lambton Quay, Willis Street and Courtenay Place.

Preferred Way Forward

Strategies and Policies	Alignment Summary
LGWM programme objectives	STRONG
Golden Mile investment objectives (see below for further discussion)	STRONG
Government Policy Statement on Land Transport 2021	STRONG
Arakai – Waka Kotahi's 10 year plan	STRONG
Waka Kotahi New Zealand Transport Agency Road to Zero 2020 – 2030	MODERATE
Wellington Regional Land Transport Plan 2021	STRONG
Wellington Regional Public Transport Plan	STRONG
Greater Wellington Regional Council Long Term Plan 2018 – 28	MODERATE
Wellington Regional Growth Framework	MODERATE
Wellington Urban Growth Plan 2014 – 2043	STRONG
Our City Tomorrow: Spatial Plan for Wellington City	STRONG
Wellington Towards 2040: Smart Capital	STRONG
Te Atakura First to Zero: Wellington City's Zero Carbon Implementation Plan 2020 – 2030	STRONG

- Once you have decided preferred way forward you can now define the scope accurately
- Project management plan provides milestones and timelines
- Lecture Week 7
- What is your high-level plan? Multiple projects?
- Milestones, deliverables, dependencies,

Think: how will rollout work. Some projects may be enacted in the short term, some may have a longer horizon

Project Cancellations

In reality, not all projects proceed to completion.

Can be due to:

- Political decisions
- Projects going over budget (blow out)
- Public perception

Auckland Light Rail – Discontinued due to large cost – 6 yrs - \$228M

Let's Get Wellington Moving Programme (\$7.4B)
– Dissolved

Golden Mile (\$140M) paused in 2024

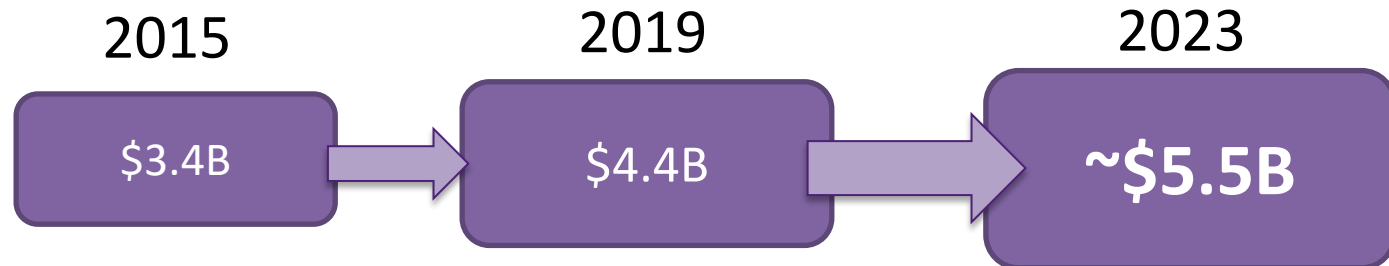
Cook straight Ferry replacement (775M-2018,
2.6B 2023) - cancelled



There are many reasons a project may go over budget:

- Underestimating project scope
- Unforeseen events: Gabriel, COVID
- Scope creep – changes to designs as information becomes known
- Assumptions don't hold, (best and worst case scenarios)

CRL, mainly because of covid and increasing cost pressures



Cost Increases

City Rail Link Ltd (CRL Ltd) today confirms it has submitted a formal funding request to its Sponsors – the Crown and Auckland Council – reflecting revised costs and time required to complete the project as a result of the Covid-19 pandemic, lockdowns and associated impacts.

The cost of the project is now estimated to be \$5.493bn a \$1.074bn increase on the previous estimate of \$4.419 billion, which was approved by the Sponsors in May 2019.

Scope Creep

“Eighteen months ago, the value of work in the infrastructure pipeline on both sides of the Tasman was \$80 billion – the value of that work is now estimated at \$230 billion.”

“Last year, a decision was made to increase the scope of the project to accommodate longer, nine-car trains at stations. Planning today for a city that will be much bigger in the future reinforces the benefits the City Rail Link City will deliver to the way people travel, work and live in Auckland.”

The Business case follows a systematic method to plan as well as possible, but in reality, you will always face uncertainty and unpredictability



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