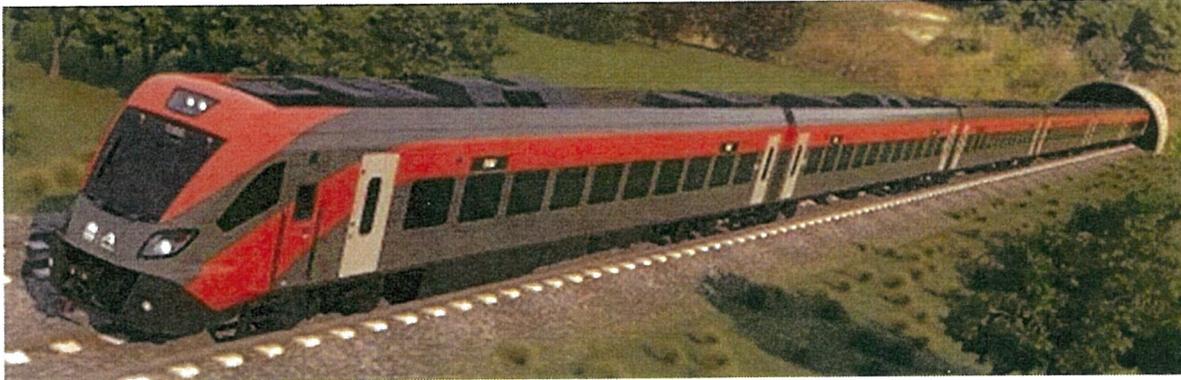


Longer Distance Rolling Stock – Draft Business Case



Sustainable Transport Committee 7 August 2019



The Vision...

- Modern dual-mode trains servicing the burgeoning Wairarapa and Kapiti-Manawatu corridor commuter and tourist markets
- Faster and more frequent peak, inter-peak and weekend services – rapid turnaround, more choices daily
- Airline style seating, modern air-con, dual mode sustainability
- Freeing up metro capacity at Waikanae, Paraparaumu, Porirua, Upper Hutt, Waterloo and Petone



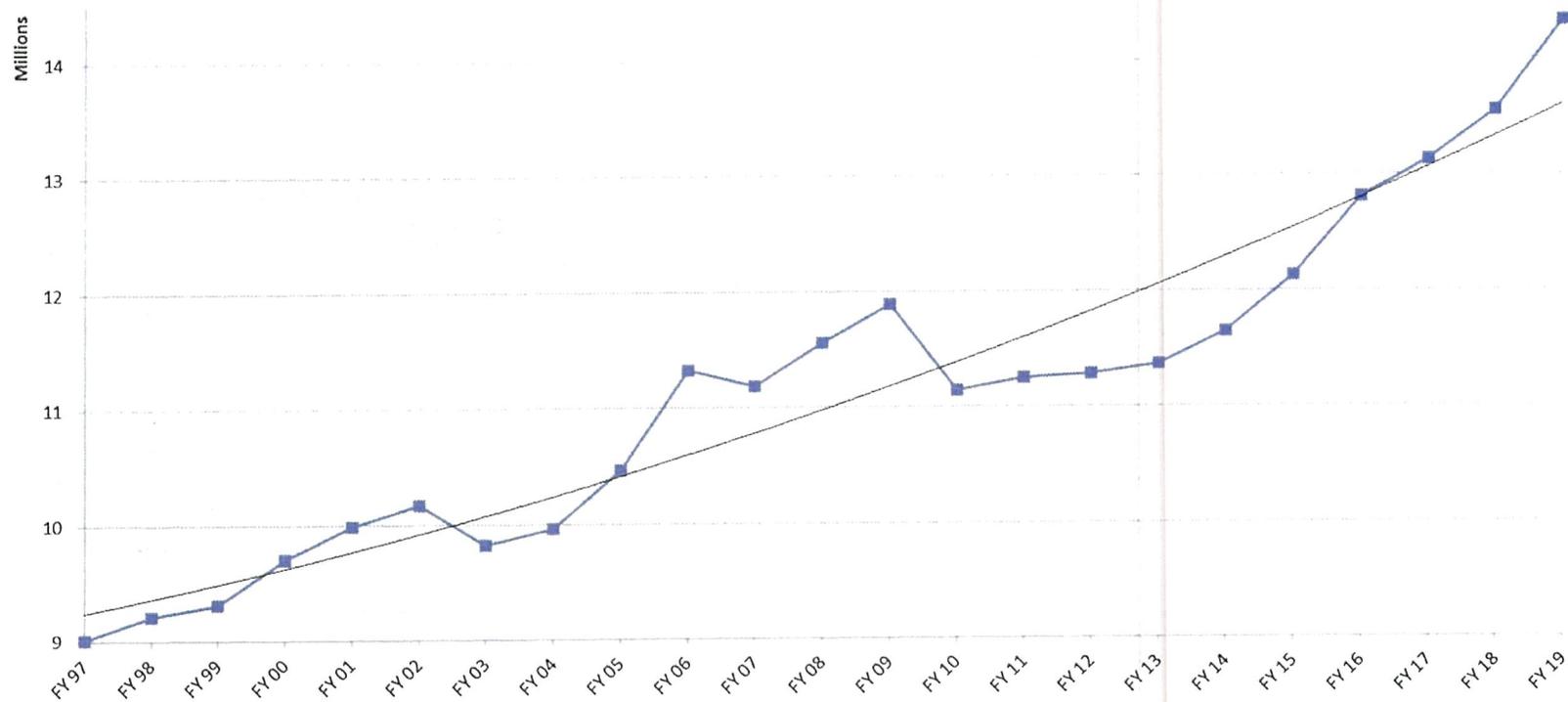
The short story...

- Wairarapa and Capital Connection carriages 50 yrs old, inefficient operationally, worn out and full
- Growth pressure along both corridors, and metro peak at key stations
- Inefficient and not enough scale to just replace Wairarapa carriages or add to Matangi fleet
- Buy enough to dramatically lift service levels, and buy medium term capacity across the network

Content:

- The problems
- Benefits of investment
- Options
- Costs
- Economic benefits
- Conclusion
- Next steps

Overall rail patronage growth



Wairarapa growth

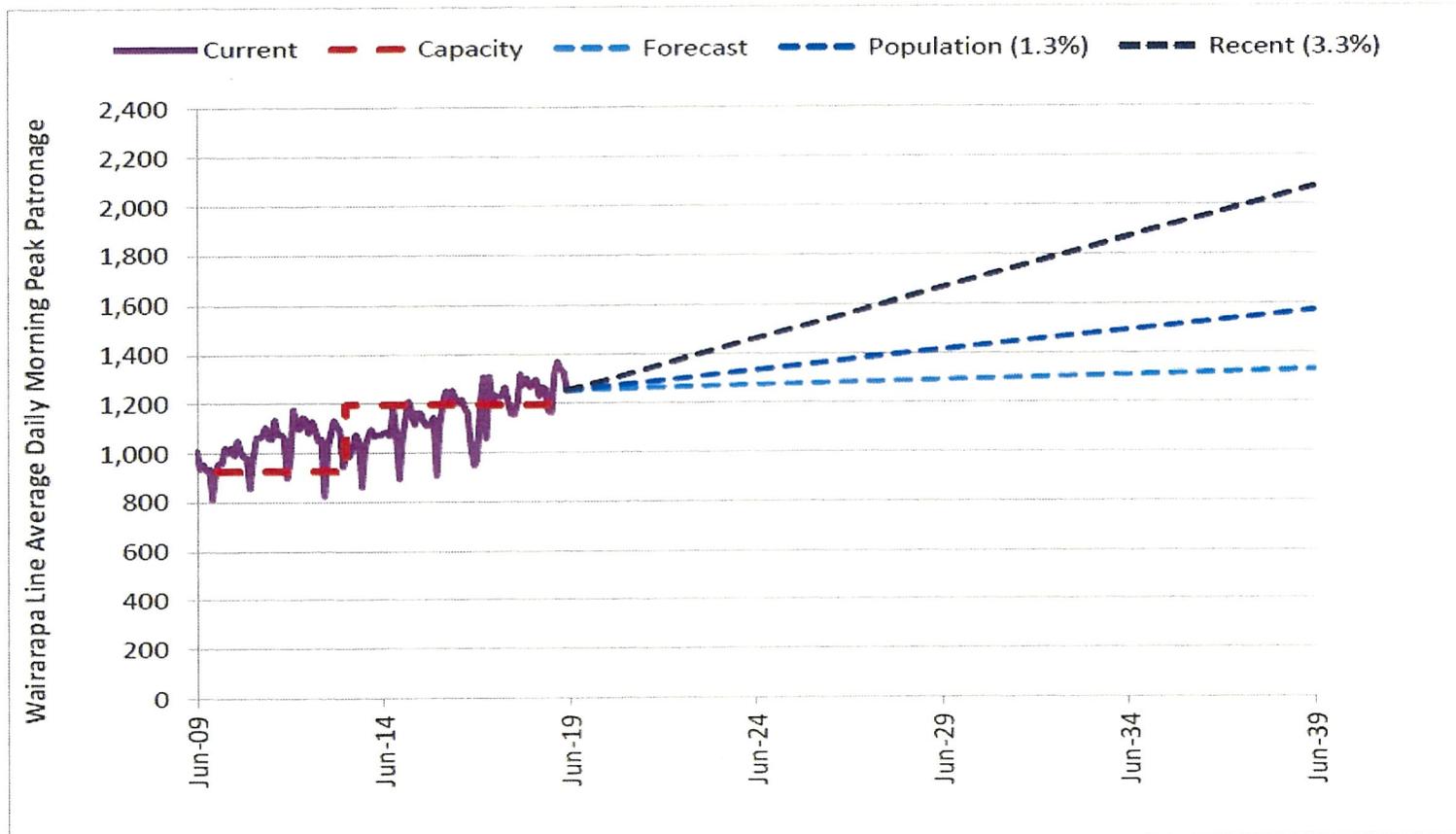


Figure 1-1: Wairarapa Line morning peak patronage and projected demand

Capital Connection growth

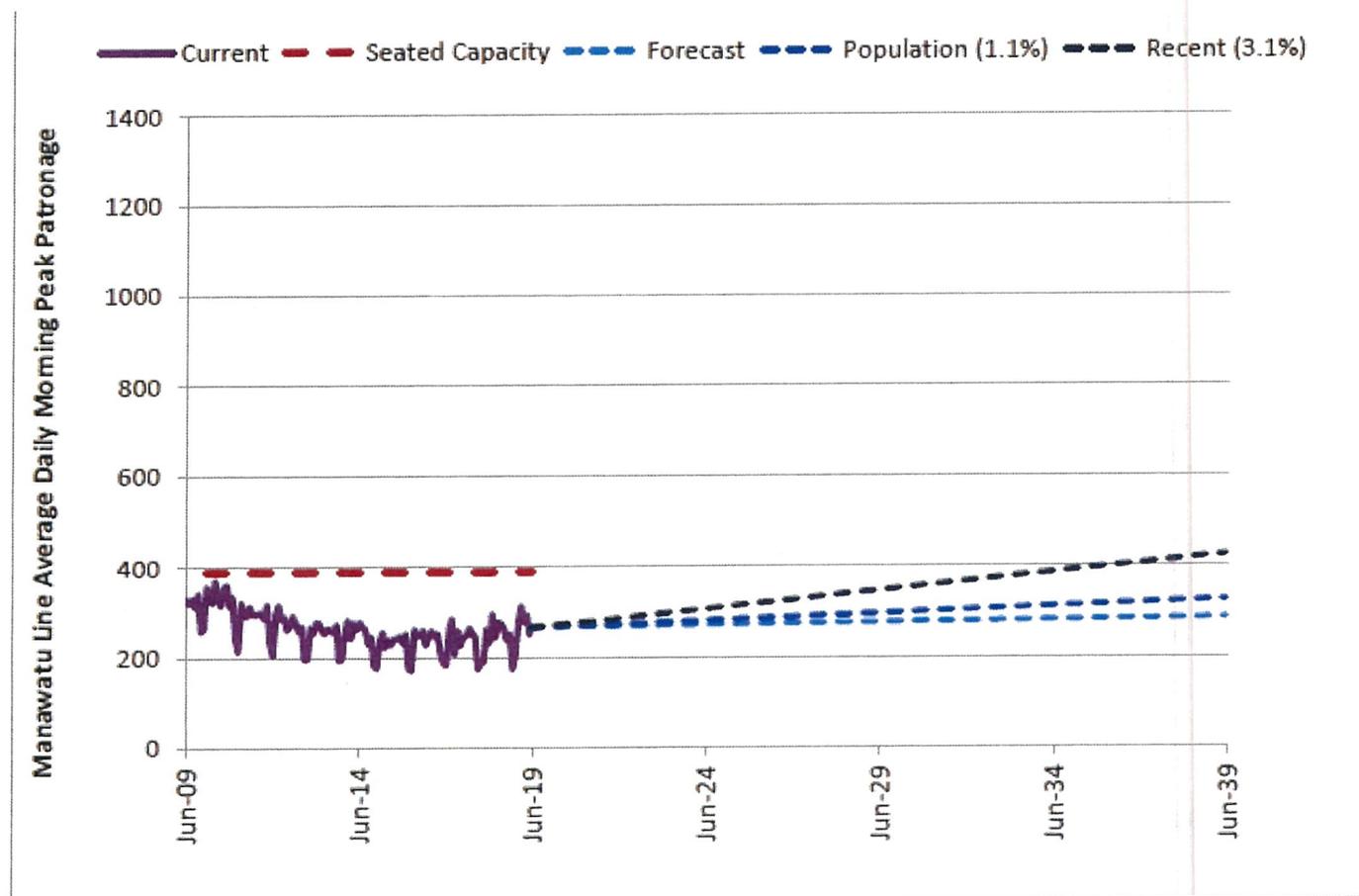


Figure 3-4: Manawatu Line morning peak patronage and projected demand

Metro growth

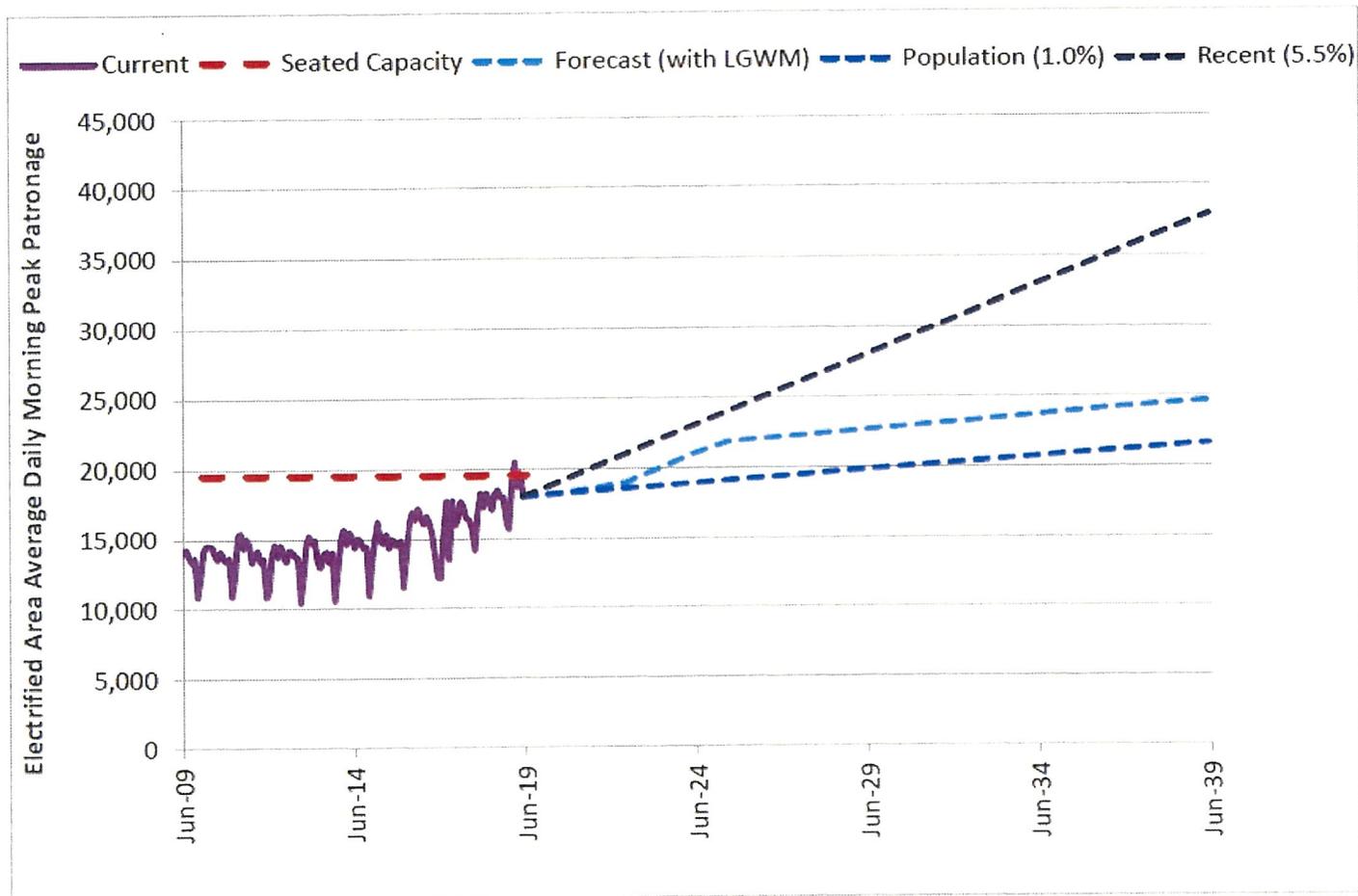


Figure 1-2: Electrified area morning peak patronage and projected demand

Demand vs capacity

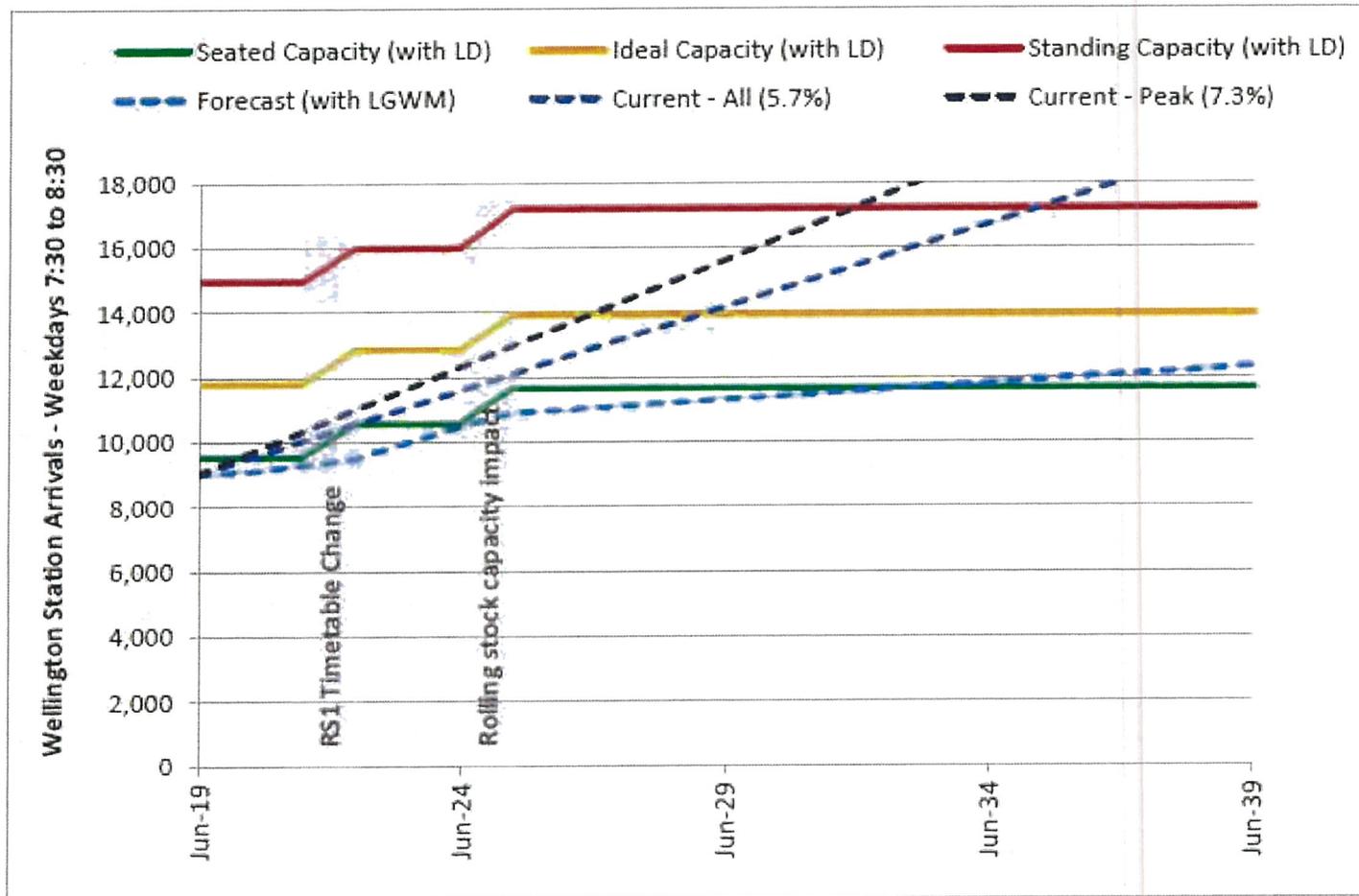


Figure 1-4: Projected Wellington Station morning peak hour demand and extra capacity (all Metlink lines)

Operational inefficiency

1. Different operations and contracts
2. Mixed fleets
3. Locomotive hauled costs
4. Locomotive hauled limitations

Train condition

1. All carriages approaching 50 years old
2. Rebuilds to varying degrees but more required
3. \$10m+ required to keep going anyway
4. All stock is tired from heavy use, and struggling with demand



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Benefits of investment

1. Enhanced regional connectivity
2. Improved rail service quality
3. More resilient transport network
4. Value for money



6 investment options: (pg.vii)

1. Do minimum – W'rapa as is / CC ceases
2. More W'rapa carriages (incr. freq) / CC as is
3. Elec to Featherston / Otaki – buses beyond
4. Replace all with DMUs – incr. freq
5. **Replace all with DMMUs – incr. freq**
6. Elec all, replace all with EMUs – incr. freq

Key: DMU = Diesel Multiple Unit, DMMU = Dual-Mode Multiple Unit

EMU = Electric Multiple Unit

Origin / Destination	MANAWATU						WAIRARAPA					
	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	PN-W	PN-W	PN-W PN-O O-W	PN-W L-W	PN-W L-W	PN-W L-W	M-W	M-W	M-W M-F F-W	M-W	M-W	M-W
2018												
2019	1							3				
2020	1							3				
2021	1		1		1	1		3			3	
2022	1		1		1	1		3			3	
2023		1										3
2024		1										
2025												
2026								4				
2027			2	2	1	1		4		4	4	
2028			2	2	1	1	1	4	4	4	4	
2029			2	2	1	1	1	4	4	4	4	
>2030			2	2	1	1	1	4	4	4	4	4
2018												
2019								2				
2020								2				
2021								2			2	
2022								2			2	
2023								2			2	
2024												2
2025												
2026			2	2	2			3		3	3	
2027			2	2	2			3	3	3	3	
2028			2	2	2	2		3	3	3	3	3
2029			2	2	2	2		3	3	3	3	3
>2030			2	2	2	2		3	3	3	3	3
2018												
2019								2				
2020								2				
2021								2			2	
2022								2			2	
2023								2			2	
2024												2
2025												
2026			2	2	2			4		4	4	
2027			2	2	2			4	4	4	4	
2028			2	2	2	2		4	4	4	4	4
2029			2	2	2	2		4	4	4	4	4
>2030			2	2	2	2		4	4	4	4	4

LEGEND	PN	Palmerston North	F	Featherston		Locomotive hauled train		EMU, DMU or DMMU		Bus connection	2	Number of services
	O	Otaki	W	Wollington								
	M	Masterton										



Table 1-2: Option assessment summary¹

	Option 1: Maintain Wairarapa Fleet	Option 2: Maintain & Boost Existing Fleets	Option 3: Partial EMU Fleet	Option 4: New DMU Fleet	Option 5: New DMMU Fleet	Option 6: Full EMU Fleet
Investment Objectives						
Increase service capacity	L	M	M	H	H	H
Achieve customer satisfaction of 95%	L	L	L	H	H	H
Maximise rolling stock operational flexibility	L	L	L	M-H	H	M
Minimise whole of life costs per passenger	H	M	M-H	H	H	L
Critical Success Factors						
Strategic alignment	L	L-M	M	M-H	H	M-H
Affordability - capital	H	M	M	M	M	L
Affordability - operational	H	L-M	M-H	M	M	M
Technical achievability	H	H	L	H	M-H	H
Public acceptability	L	L-M	L	M	M-H	M
Characteristics						
Indicative 30-year net cost over do-minimum (2019 \$m)	-	\$227 - \$386	\$200 - \$364	\$176 - \$343	\$202 - \$381	\$454 - \$754
Indicative 30-year BCR over do-minimum	-	0.9 - 2.2	0.9 - 2.2	1.2 - 3.3	1.1 - 2.9	0.5 - 1.2
Indicative 60-year BCR over do-minimum	-	1.1 - 3.1	1.1 - 3.3	1.4 - 5.0	1.3 - 4.2	0.7 - 2.0
Indicative implementation timeframe (from July 2019)	13 years	3 years	7 years	7 years	7 years	9 years
Overall Ranking	4	5	6	2	1	3

Costs

Table 5-12: Capital investment components

	DMU	DMMU
Rolling stock	██████	██████
Maintenance facility	██████	██████
Stations	██████	██████
Network infrastructure	\$120.3m	\$120.3m
Capital Connection capex	██████	██████
Total capital funding required	\$379.0m	\$415.3m

Discounted costs over do-min.

Table 5-5: 30-year discounted cost of DMMU cost elements over the do-minimum

	Low Growth Costs (2018 \$m)	Medium Growth Costs (2018 \$m)	High Growth Costs (2018 \$m)
Fare revenue	[REDACTED]	[REDACTED]	[REDACTED]
Rail contract passenger service fee costs	[REDACTED]	[REDACTED]	[REDACTED]
Locomotive hire costs	[REDACTED]	[REDACTED]	[REDACTED]
Fuel costs	[REDACTED]	[REDACTED]	[REDACTED]
Network access charges	[REDACTED]	[REDACTED]	[REDACTED]
Train maintenance costs	[REDACTED]	[REDACTED]	[REDACTED]
Station maintenance costs	[REDACTED]	[REDACTED]	[REDACTED]
Total operational costs	\$77.00	\$63.30	\$60.70
Station upgrade construction costs	[REDACTED]	[REDACTED]	[REDACTED]
Maintenance facility construction costs	[REDACTED]	[REDACTED]	[REDACTED]
Network infrastructure construction costs	[REDACTED]	[REDACTED]	[REDACTED]
Rolling stock purchase costs	[REDACTED]	[REDACTED]	[REDACTED]
Total project capital costs	\$227.90	\$227.90	\$227.90
Total DMMU investment proposal costs	\$304.90	\$291.20	\$288.60

Benefits (NZTA EEM)

- Road user benefits ~80%
 - Public Transport user benefits ~20%
 - Other benefits – CO₂ \$65/t
-
- Agglomeration, consumer surplus used in sensitivity testing
 - Accessibility, productivity, resilience, option, non-use and other wider benefits used to support GPS objectives etc

Benefits (NZTA EEM)

Table 5-7: Results of DMMU cost benefit appraisal

	Low Growth	Medium Growth	High Growth
2% discount rate			
Benefits (present value – 2018 \$m)	\$547.6	\$764.7	\$843.6
Net costs (present value – 2018 \$m)	\$343.0	\$324.0	\$319.7
Benefit Cost Ratio	1.6	2.4	2.6
4% discount rate			
Benefits (present value – 2018 \$m)	\$401.0	\$551.7	\$603.0
Net costs (present value – 2018 \$m)	\$304.7	\$291.2	\$288.6
Benefit Cost Ratio	1.3	1.9	2.1
6% discount rate			
Benefits (present value – 2018 \$m)	\$301.2	\$408.2	\$442.1
Net costs (present value – 2018 \$m)	\$273.4	\$263.7	\$261.9
Benefit Cost Ratio	1.1	1.5	1.7

Conclusion

- 15 4-car DMMU
- Trains + depot/stations \$ 285m
- Network \$ 120m

- Best case first train in-service 2025



Conclusion

- 30yr discounted costs \$291.2m
- 30yr discounted benefits \$551.7m
- BCR medium 1.3 to 2.6
- Without network \$, BCR 2.2 to 4.1
- GPS result alignment criteria:
 - Access to opportunities.. liveable cities
 - **Very High**
- Combination of VH and BCR >1 = P1

Funding proposal

- [Redacted]
 - [Redacted]
 - [Redacted]
 - [Redacted]
- | | |
|------------|------------|
| [Redacted] | [Redacted] |
| [Redacted] | [Redacted] |

Funding allocations and bids

- Project bid exists in Regional Land Transport Programme and allocation in Long Term Plan
- The funding requirements, FAR assumptions and cashflows need significant revision



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Next steps

- Engage with stakeholders on the draft business case for feedback and comment:

Horizons RC, NZTA, MoT, TAs, KiwiRail, Transdev, GWRL

- Seek council approval to formally submit to NZTA at 2 October council meeting



“Transportation is the center of the world! It is the glue of our daily lives. When it goes well, we don't see it. When it goes wrong, it negatively colors our day, makes us feel angry and impotent, curtails our possibilities.”

-Robin Chase-

