CAP-IT
Decarbonisation of the Transport Sector in Samoa

Transport Group Conference 2024

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Flow Transportation Specialists

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KVACONSULT LTD

JUST ADD LIME

foreseeable

Samoa

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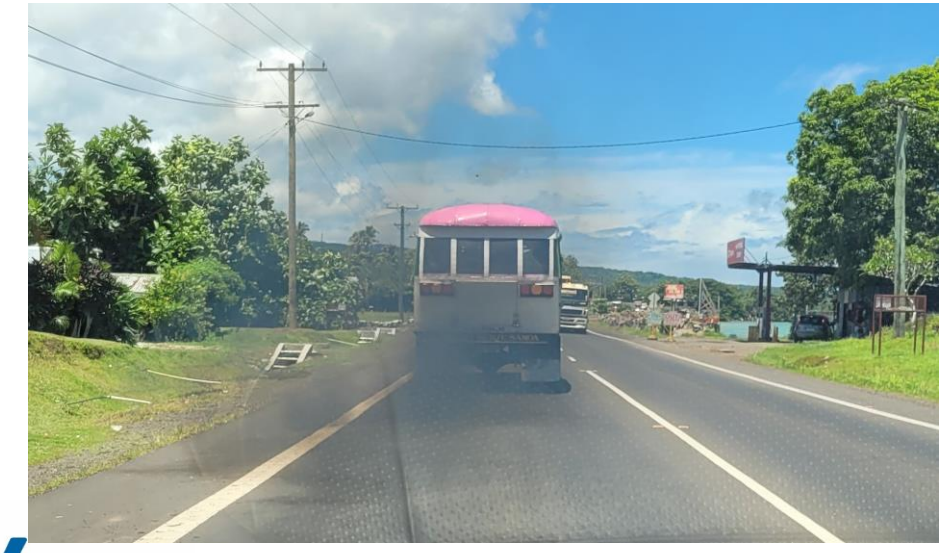
Also Samoa



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CAP-IT Project Summary

Regional project umbrella:

Promoting Green Transformation in the Pacific Region towards Net-zero and Climate-resilient Development (PNG, Samoa, Timor-Leste, Vanuatu)

(21-Feb-23 – 21-Feb-25)

***General outcome**:*

Jump start the green transformation to achieve a clean energy future and increase resilience to climate change

***CAP-IT focus**:*

Promoting decarbonization of Samoa's land & maritime transport sectors by embracing electric transportation solutions

***Donor**:*

Government of Japan (USD 36,8 mill)

***CAP-IT Project Value**:*

~ USD 15,5 mill

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OUTCOME 1:

STRENGTHENING INSTITUTIONAL GOVERNANCE, FINANCIAL AND TECHNICAL CAPACITY OF THE **TRANSPORT SECTOR** TO PROMOTE ECONOMIC DEVELOPMENT OF LAND AND MARITIME TRANSPORT **WITHOUT HARMFUL EMISSIONS**

OUTCOME 2:

INCLUSIVE AND ACCESSIBLE DECARBONIZATION OF THE **LAND** TRANSPORT SECTOR BY CREATING GREENER TRANSPORTATION SYSTEMS

OUTCOME 3:

DECARBONIZATION OF THE **MARITIME** SECTOR

Target 25 Gg CO_2 reduction from Land Transport Sector by 2030

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Why develop a low carbon transport system for Samoa, when their emissions are less than 0.01% of global emissions?

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Reduce imported fuel dependence

Better choices to access jobs, education, shops and healthcare

Establish Samoa as ready for the future

Improve air quality, reduce noise

Demonstrator for other island nations

Improve health outcomes through active travel

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Samoa – Transport Context

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Buses

- Really well used
- 60% “wooden” buses
- Iconic and popular
- Convenient, bus stop is wherever you want
- Natural air conditioning
- “Atmospheric”
- Fun!

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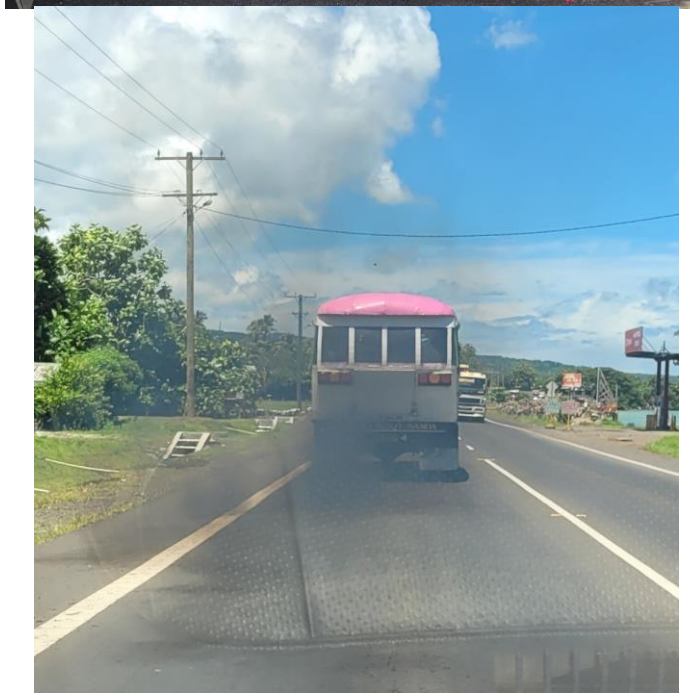
..also buses

- Mostly over 25 years old
- Poor accessibility
- No maps or timetables
- Frequent stopping
- Overcrowding
- 6 litre diesel engines
- Smokey and noisy
- Idling



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Bus infrastructure

- Main bus station in Apia lacking
- Some bus stops and shelters, but…

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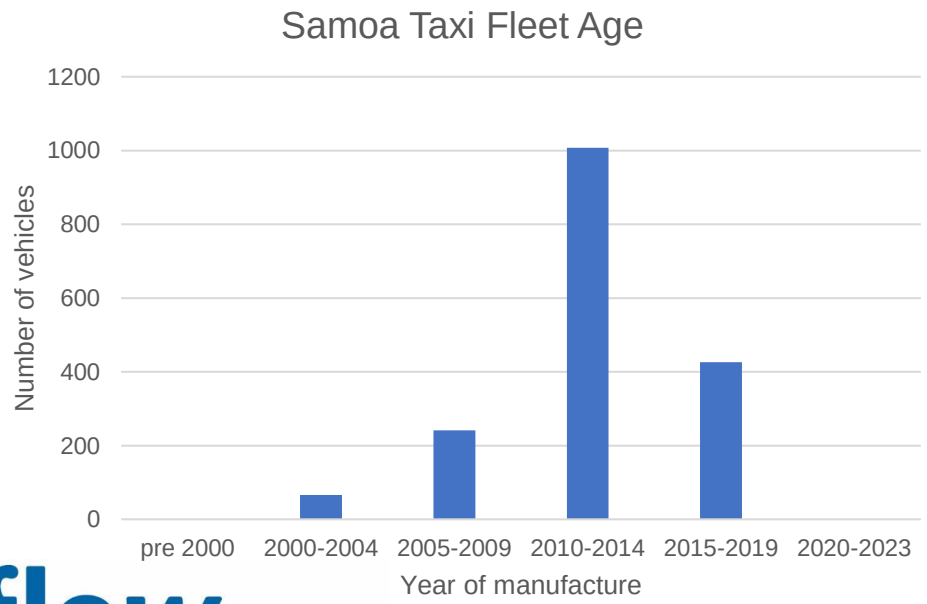
Taxis

- Plentiful
- Relatively cheap
- “Less than 15 years old”
- Petrol powered



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Private Cars

- ~24,000 private cars, vans, pickups, minibuses
- Low car ownership but rising quickly
- Large vehicles popular
- Oldish fleet
- Low annual mileage
- Hardly any hybrid or electric

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Walking and cycling

- Footpaths in Apia and along main road
- Raised crossings
- Low speed limits
- Police bikes
- 17% of households “own a bike”

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…also walking and cycling

- Lacking network of footpaths outside Apia
- Parking on footpaths
- Very wide vehicle crossings
- Zero cycling infrastructure and almost zero cyclists
- IT'S REALLY HOT!

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Motorcycles and Scooters

- Nope

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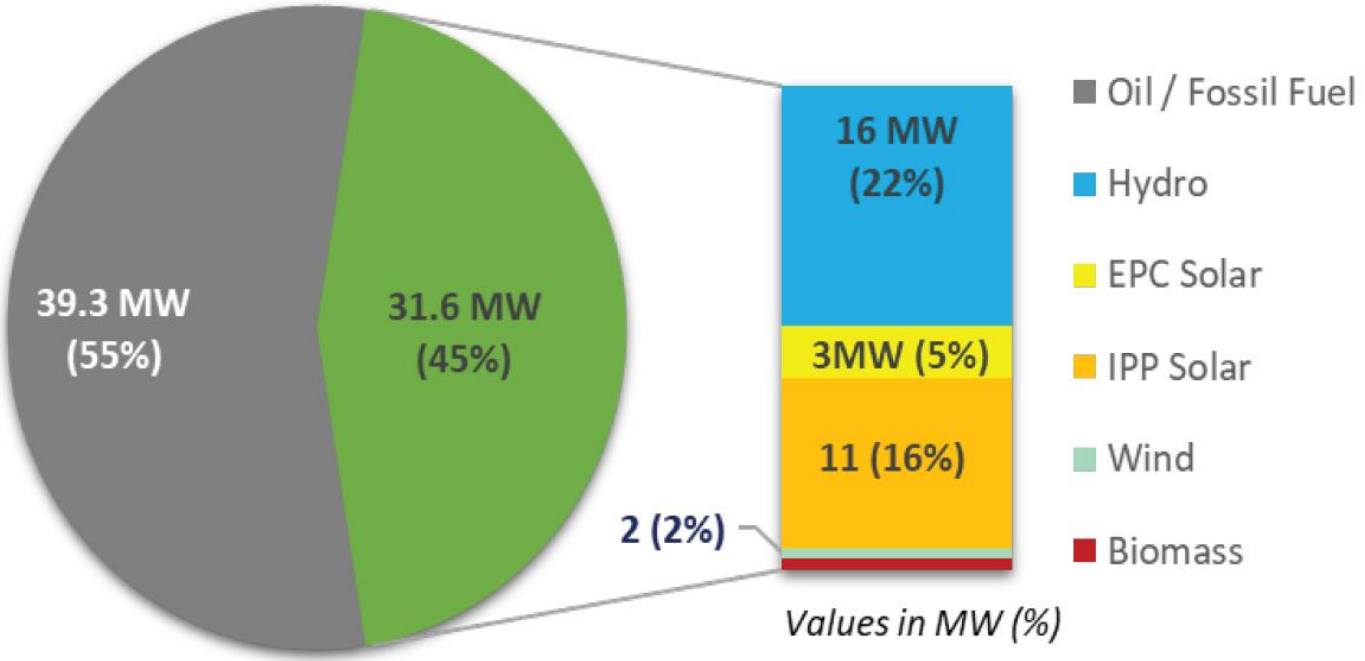
Oh, and..

- Samoa's electricity is currently 55% generated from burning diesel



- Target is 70% renewable by 2030

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Decarbonisation Strategy

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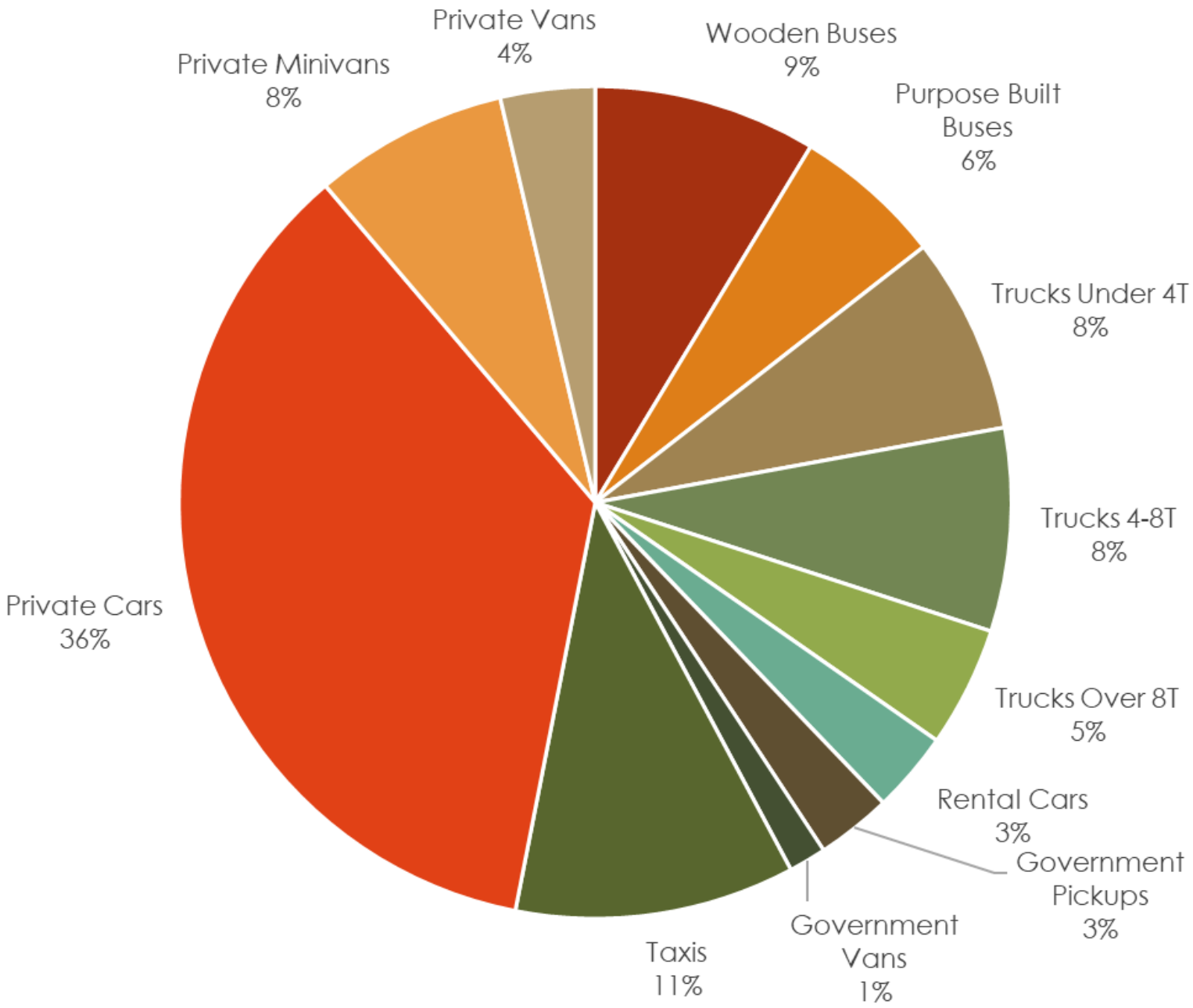
STEM

Vehicle Type	Buses			Un
Sub-Type	Wooden Buse	Purpose Built Bu	Total	
# Vehicles	170	148	318	
Av Man Year	1999	2012		
Av CC	6000	4400		
Fuel Econ km/l	1.5	2		
(eq mpg)	3.525	4.7		
Est Daily km Driver	140	140		
Days/Wk	5.5	5.5		
Weeks/Yr	50	50		
Annual Km / veh	38500	38500		
Annual Fuel	4,363,333	2,849,000	7,212,333	2
% total fuel	21%	14%	35%	
CO_2	11,781,000	7,692,300	19,473,300	6
% total CO2	9%	6%	14%	
passemgers	30	30		
CO2 g/km	1,800.00	1,350.00		
CO2 g/km/person	60.00	45.00		

ans	"Other"	All
615	188	**4187**
2010	2002	
2575	4900	
6	5	
14.1	11.75	
25	30	
6	6	
52	50	
7800	9000	
799,500	338,400	**20,328,448**
4%	2%	**100%**
2,158,650	913,680	54,886,809
2%	1%	40%
2.3	1.2	
450.00	540.00	
195.65	450.00	

2022 Samoa Land Transport Estimated CO_2 emissions by Vehicle Category



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Long List of Interventions

Electrify the Fleet

- Buses
  - Wooden
  - Purpose Built
- Taxis
- Government Vehicles
- Trucks
  - Light
  - Medium
  - Heavy
- Private Vehicles

Less Driving

Reduce need to drive by:

- New express e-Bus services
- Upgrade Bus stations
- Walking and Cycle paths
- Shared Mobility
  - E-Minibuses
  - E-Bikes
  - E-Motorbikes

Policy

- Sustainable Management Plans
- Remote access to services (banking, health, Govt services etc)
- Traffic management Improvements
- Overhaul of Bus Operating Model
- Vehicle Scrappage Scheme

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Option Evaluation

- MCA evaluation of 22 options
- **Objectives**: Lower carbon emissions (70%), improved equity (10%), inclusivity (10%) and accessibility (10%)
- **Feasibility**: Capital costs, legislation, capacity, complexity, stakeholder alignment
- **Social and environmental impacts**: Economic, Health, Environment, Policy and Public Alignment, Safety and Security

Option Evaluation

Need to specify degree of intervention for many options: eg

- Replace 80% of wooden buses with e-buses
- Replace 50% of taxis with electric
- 100 e-minibus for village shared mobility
- 2,500 e-bikes for village shared mobility
- Replace 20% of private cars with hybrids
- 6 new express e-bus services
- etc

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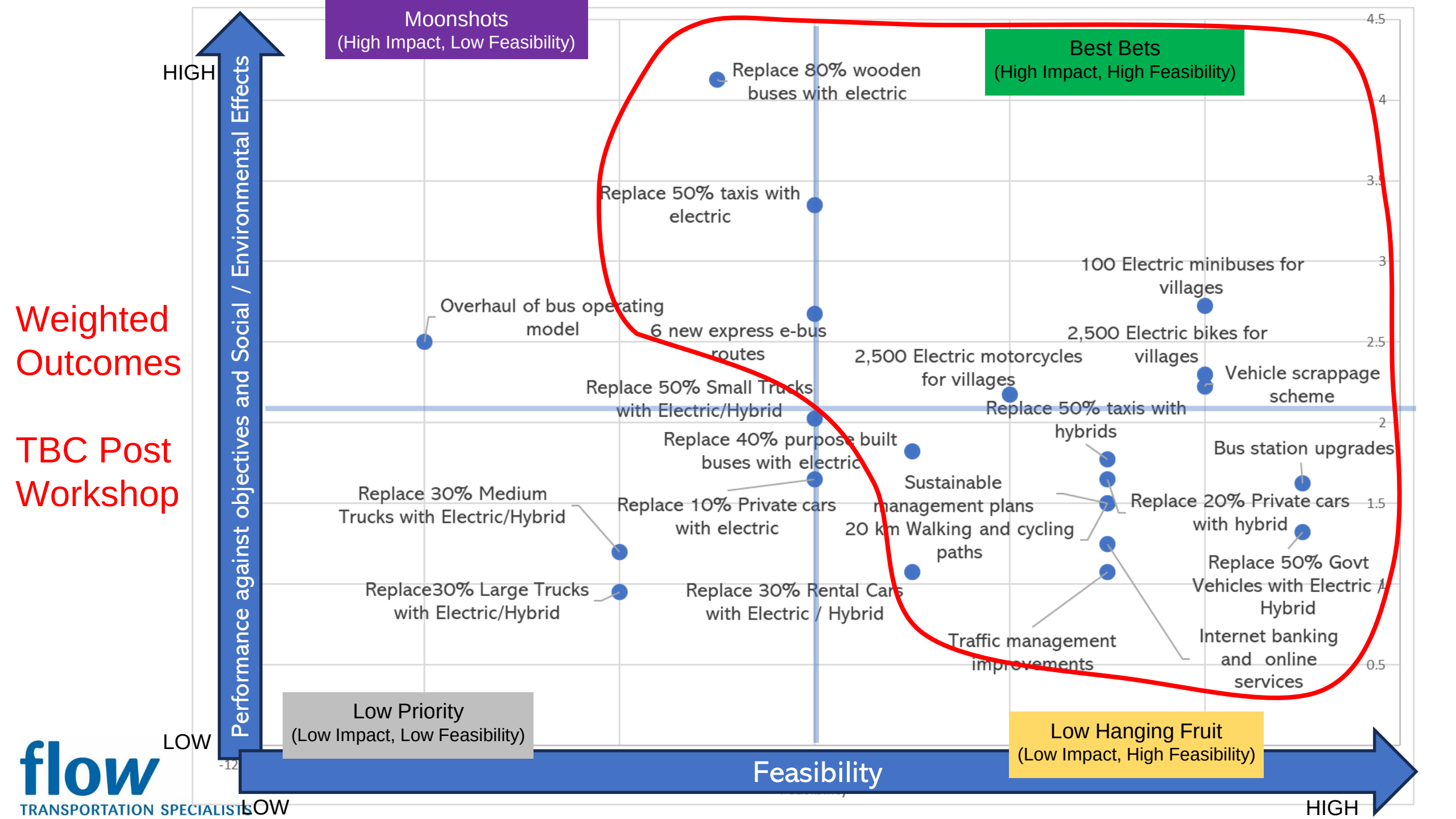

Weighted Outcomes

TBC Post Workshop

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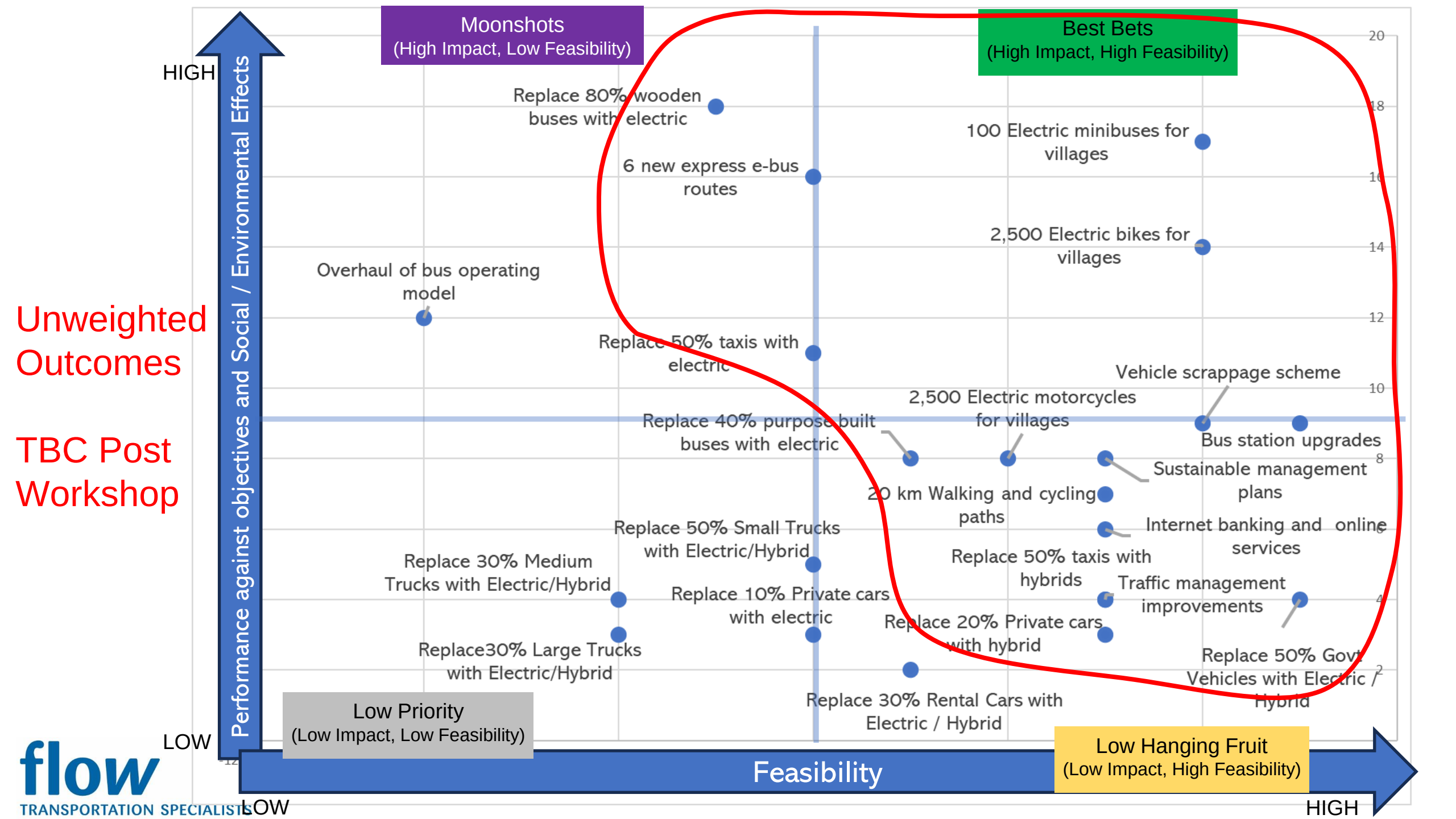

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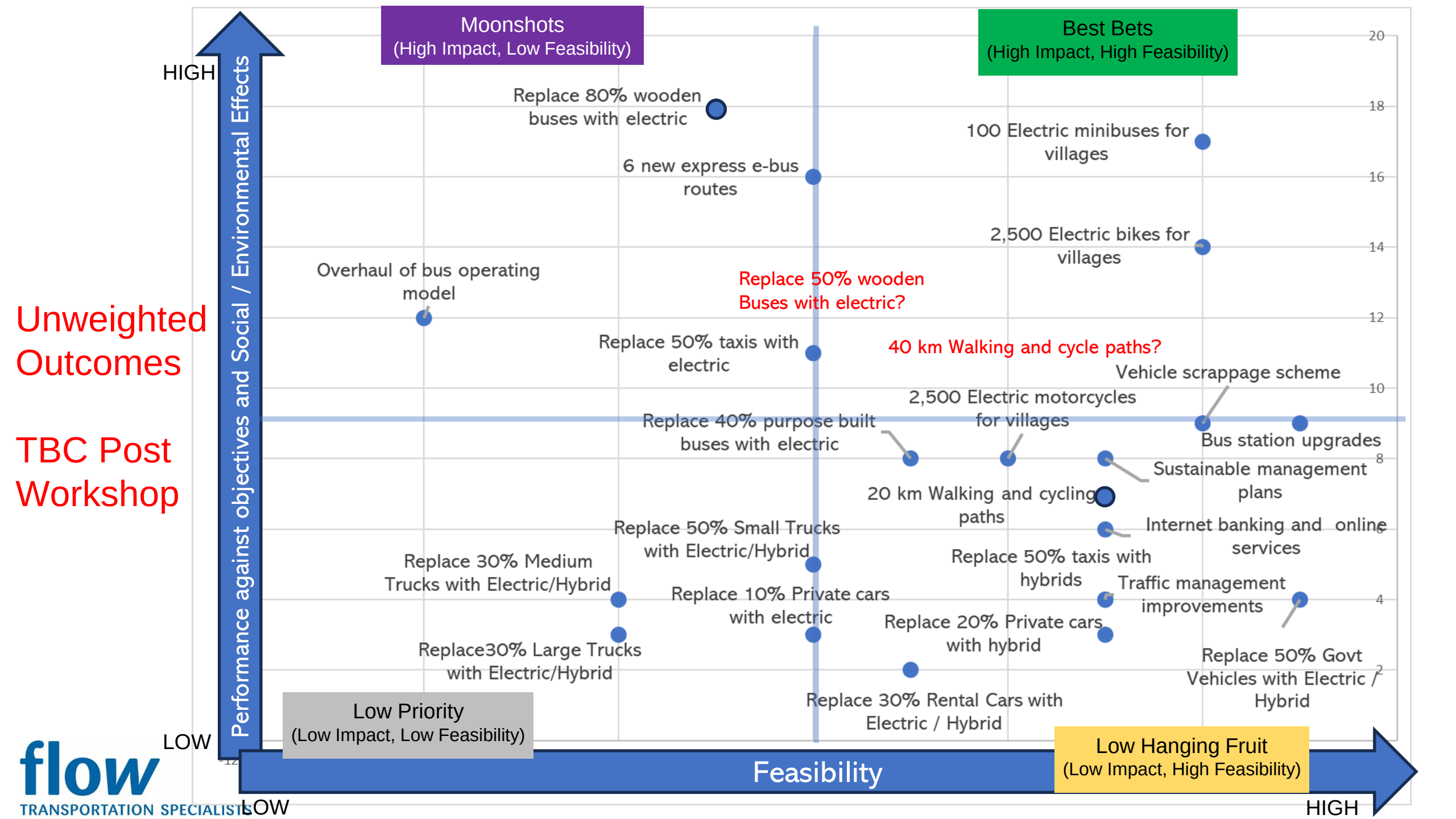
Moonshots
(High Impact, Low Feasibility)
Best Bets
(High Impact, High Feasibility)
Low Priority
(Low Impact, Low Feasibility)
Low Hanging Fruit
(Low Impact, High Feasibility)
HIGH
LOW
Performance against objectives and Social / Environmental Effects
LOW
HIGH
Feasibility
Unweighted Outcomes
TBC Post Workshop
Replace 80% wooden buses with electric
6 new express e-bus routes
100 Electric minibuses for villages
2,500 Electric bikes for villages
Overhaul of bus operating model
Replace 50% wooden Buses with electric?
Replace 50% taxis with electric
40 km Walking and cycle paths?
Vehicle scrappage scheme
2,500 Electric motorcycles for villages
Replace 40% purpose built buses with electric
Bus station upgrades
Sustainable management plans
20 km Walking and cycling paths
Internet banking and online services
Replace 50% Small Trucks with Electric/Hybrid
Replace 50% taxis with hybrids
Replace 30% Medium Trucks with Electric/Hybrid
Traffic management improvements
Replace 10% Private cars with electric
Replace 20% Private cars with hybrid
Replace30% Large Trucks with Electric/Hybrid
Replace 50% Govt Vehicles with Electric / Hybrid
Replace 30% Rental Cars with Electric / Hybrid
20
18
16
14
12
10
8
6
4
2
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What do you think?

- Have we missed any other options?
- Should we be weighting the outcomes?
- Do we need to test a range of levels of intervention for all options before deciding on a short list?

Assessing the Carbon Reduction Potential of Packages

Samoa Transport Emissions Model

Option Assessment Module

Change these proportions to test effects

Option	% of Fleet	Capital Cost $US 2023	Net Cost over 5 years $US 2023	Carbon Reduction Effect on 2022	$Capex/tonne CO2 reduced/year
Replace Wooden Bus Fleet with Electric	50.00	$36,125,000	$6,621,323	4.1%	$ 6,498
Replace PB Bus Fleet with Electric	-	$0	$0	0.0%	$ 9,031
Replace Taxis with Electric	30.00	$10,924,200	-$2,936,789	2.9%	$ 2,780
Replace Taxis with Hybrid	50.00	$16,256,250	-$626,957	2.1%	$ 5,582
Replace Govt Pickups with Electric	30.00	$6,100,500	$376,525	0.7%	$ 6,211
Replace Govt Pickups with Hybrid	30.00	$5,602,500	$644,626	0.3%	$ 12,783
Replace Govt Vans with Electric	30.00	$4,256,250	$495,947	0.4%	$ 7,980
Replace Govt Vans with Hybrid	30.00	$3,064,500	-$281,386	0.2%	$ 12,867
Replace Rentals with Electric	-	$0	$0	0.0%	$ 13,433
Replace Rentals with Hybrid	20.00	$7,389,000	-$74,066	0.2%	$ 23,100
Replace Private with Electric	5.00	$16,496,250	$1,887,731	1.4%	$ 8,343
Replace Private with Hybrid	20.00	$52,788,000	$361,262	2.6%	$ 14,630
New Express e-bus routes	50.00	$6,375,000	$1,090,460	0.5%	$ 8,972
Shift car trips to electric bike	100.00	$5,000,000	-$3,961,932	0.9%	$ 4,157
Shift car trips to electric motorbike	50.00	$10,000,000	-$377,727	1.0%	$ 7,119
Shift car trips to shared e-minibuses	100.00	$5,250,000	$676,998	0.6%	$ 6,261
Total		**$170,377,450**	**$3,596,744**	**16.4%**	

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What's next?

- Next week – MCA workshop
- June to October 2024
  - Public surveys
  - Public awareness campaigns
- Draft reports by August, final reports by December for
  - Decarbonization Strategy for the Transport Sector
  - Up-skilling programme
- August to Feb 2025
  - Sustainable Land Use and Mobility Plan

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Fa’afetai
Thank you

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