

From TOD to TAC: Net Zero Cities by

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TOD's - Re-urbanization...East Perth.

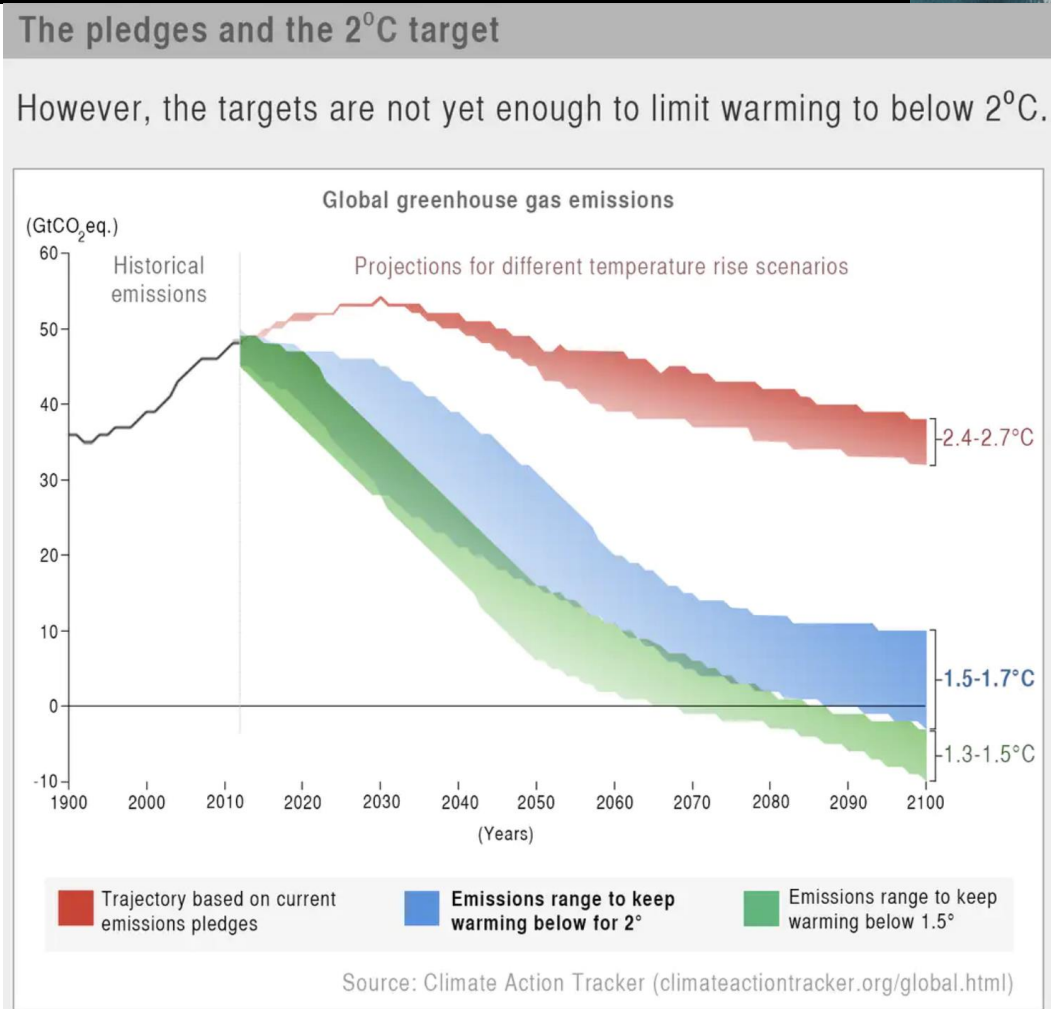
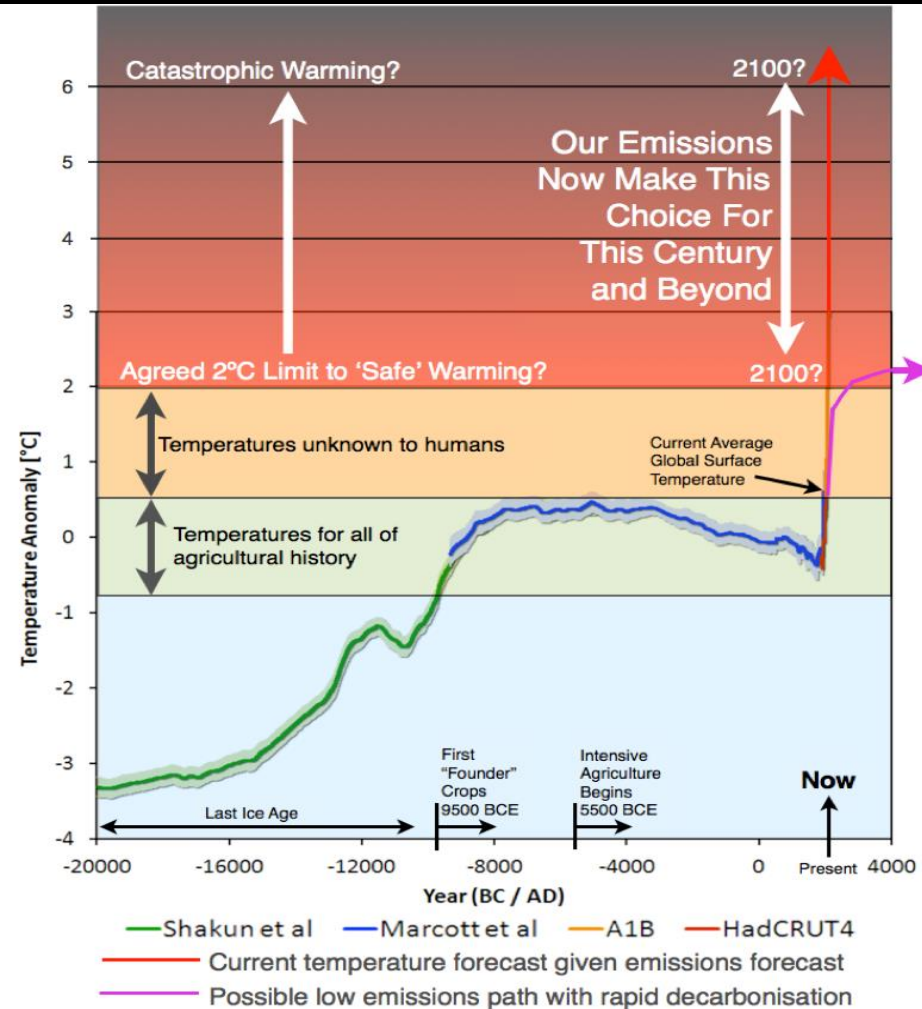
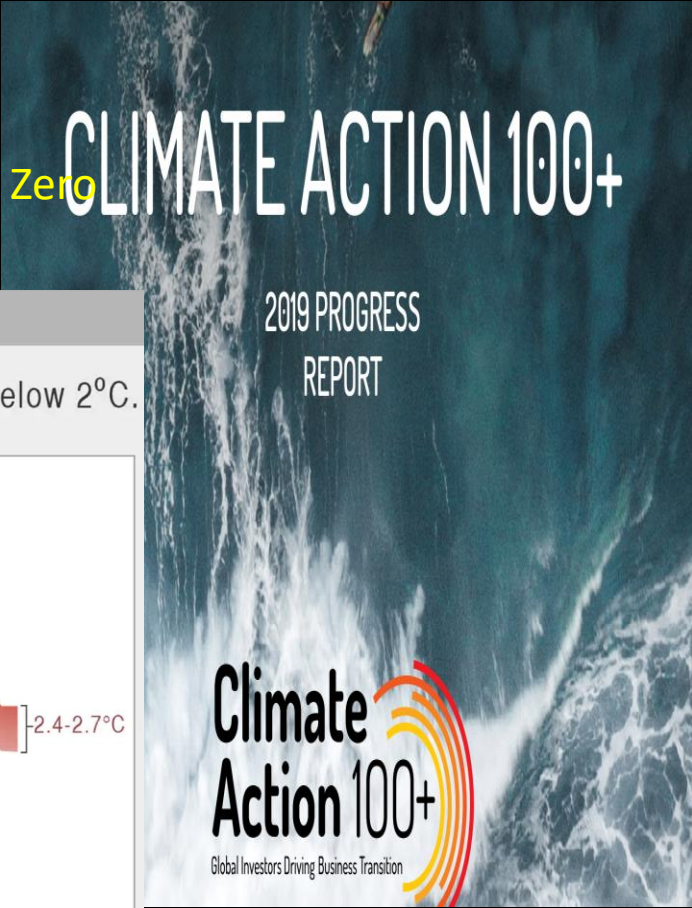


Claremont on the Park. New TOD wins UDIA award....
But what about the vast suburbs away from rail lines? TAC's!



The next agenda is Net Zero and TAC's can help....

1 in 100,000 chance it was not us. 1.5 can still be achieved. Finance has \$55 Trillion for Net Zero



The pledges and the 2°C target

However, the targets are not yet enough to limit warming to below 2°C.

the fifth state .com.au

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The Green Book The No. 1 source of embodied carbon rates for construction materials

RATING TOOLS

Perth's carbon neutral certified apartment building

BY DUNCAN MURRAY
9 HOURS AGO

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Net Zero

- REDUCE – less is best
- RENEW – clean is green
- OFFSET – carbon credits, trees do it best.

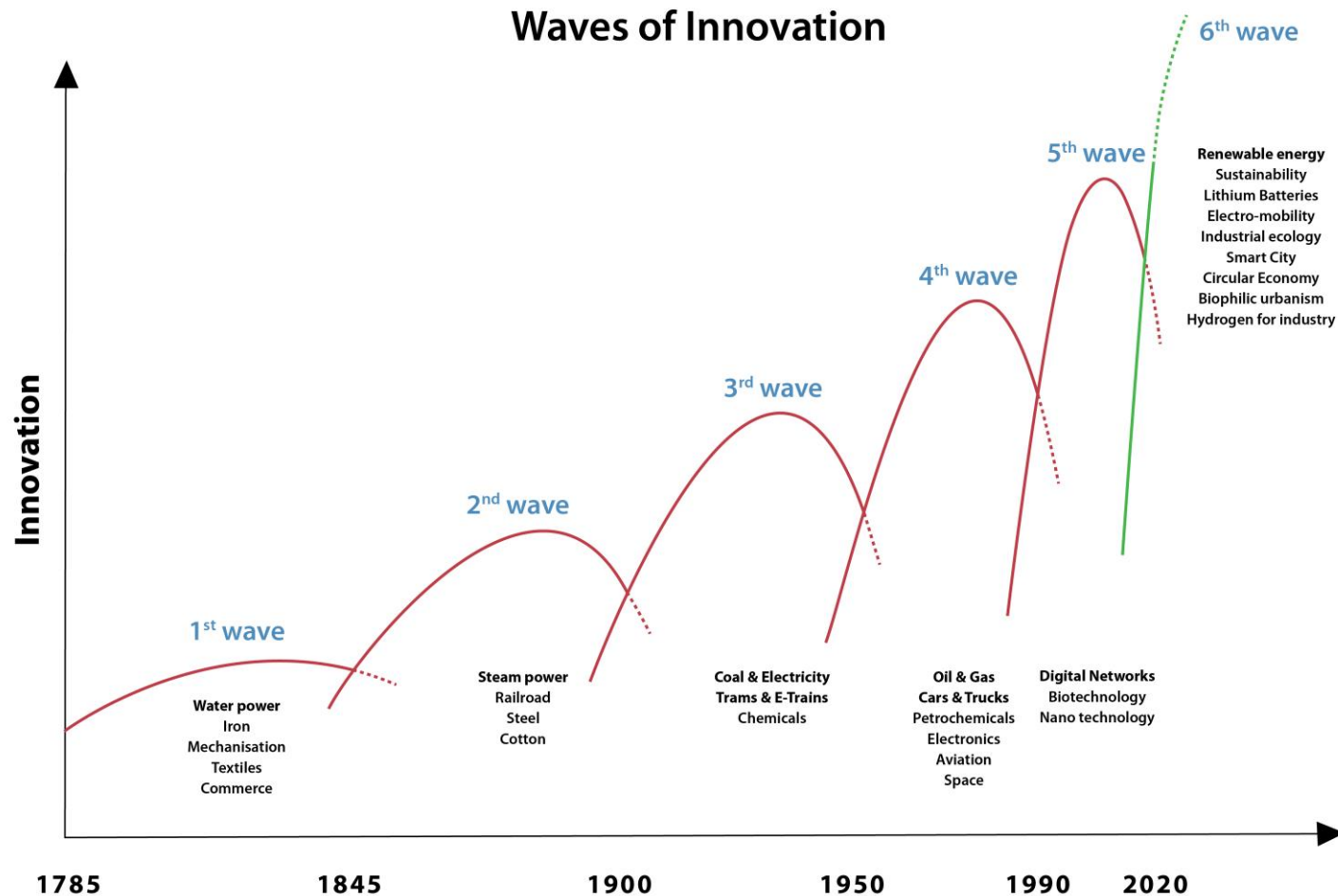
(accredited by **Climate Active**, Federal Government Agency)

Gondwana Links Project – carbon offsets 50% up in 6 mths



Why is Net Zero happening so quickly? Why *now*?

Transitions have emerged from economic collapse in 5 big waves of innovation...

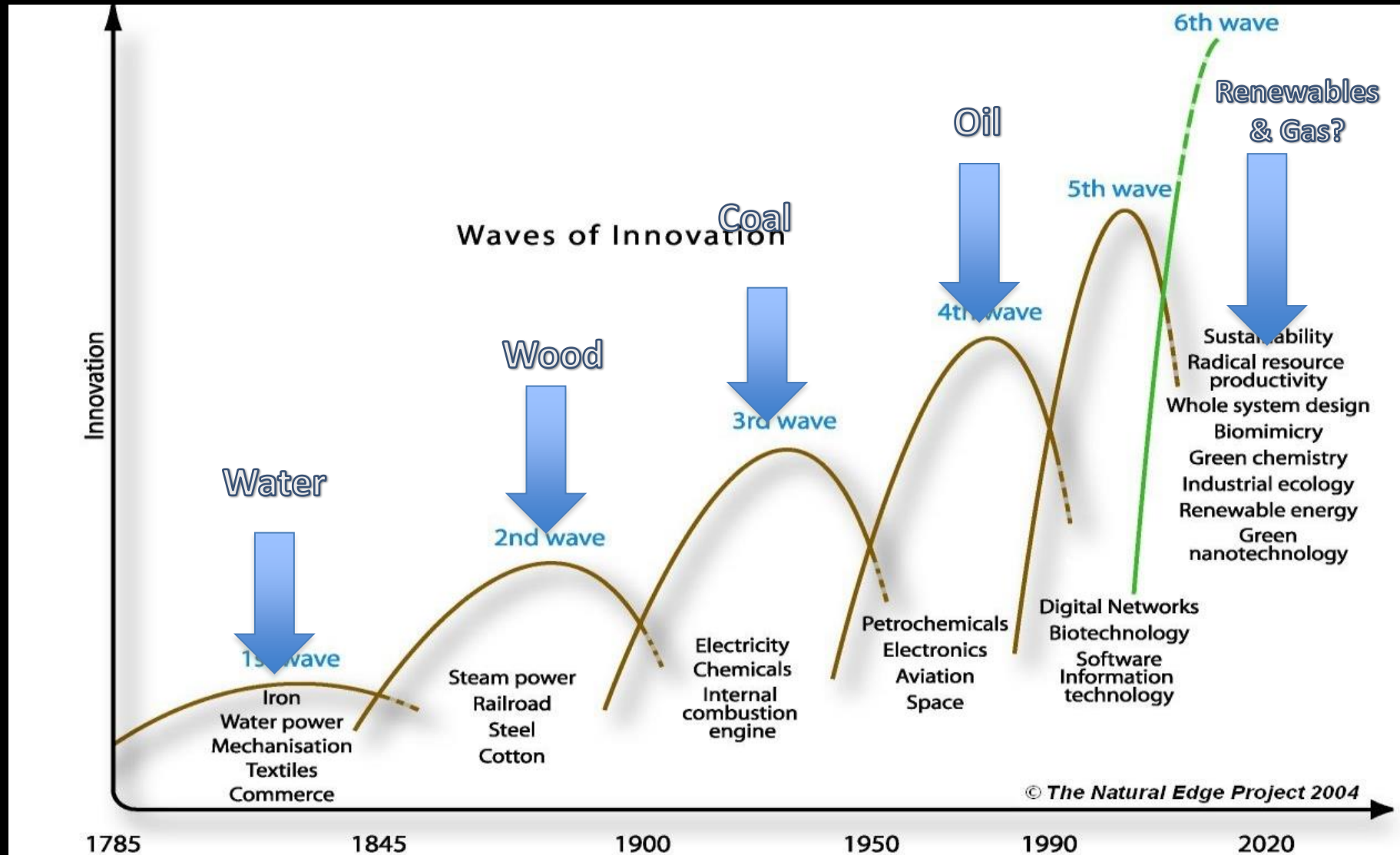


Schumpeter called the process 'creative destruction' in 1939
What is the 6th wave?

'Covid, Cities and Climate'
Urban Science

History of innovation and energy....

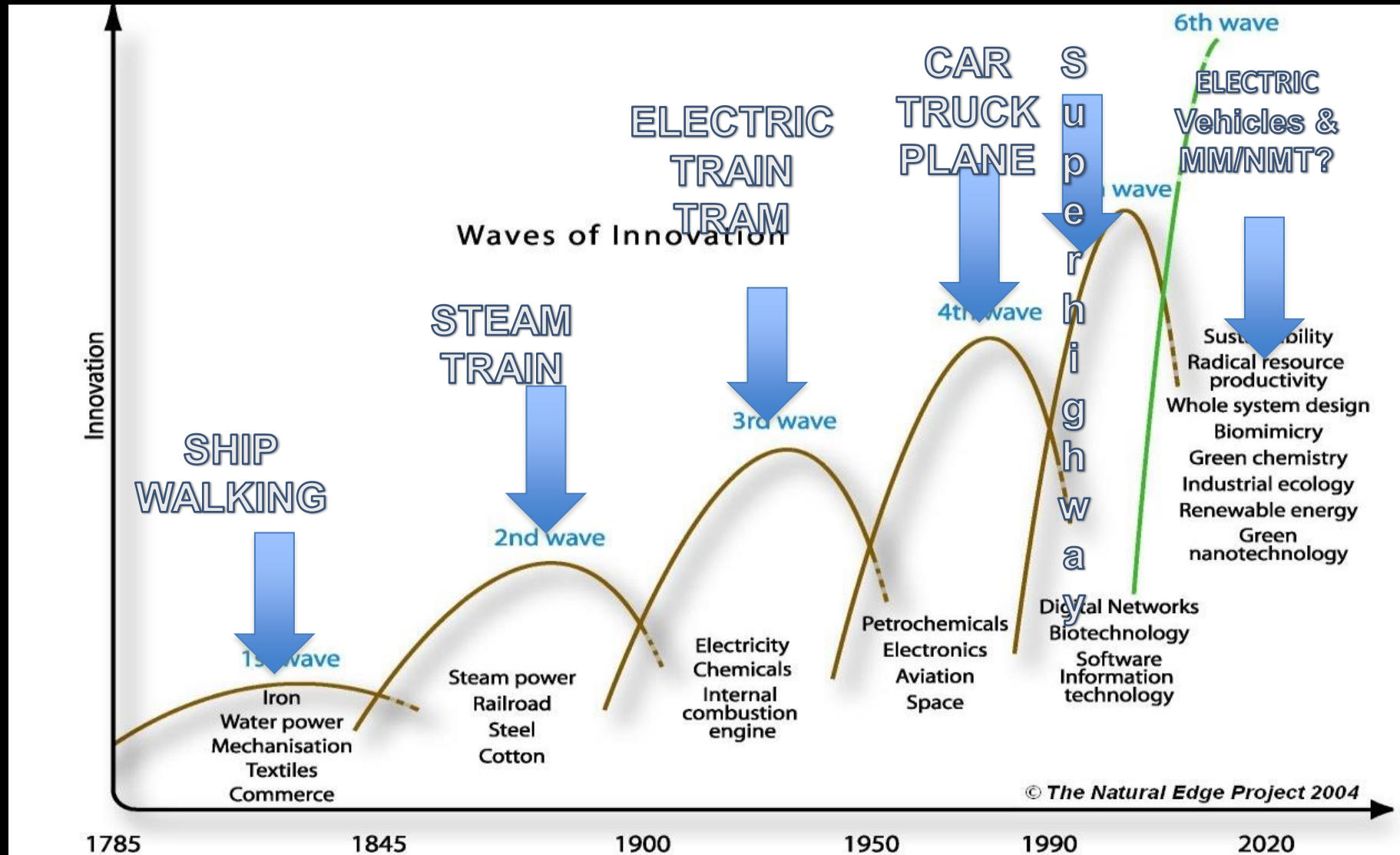
Next era of city building? ZERO CARBON in green economy?



History of innovation and cities....

Transport shapes urban fabric

Each era changes the city form. Cities keep the best of that era and move on.
Next era of city building?

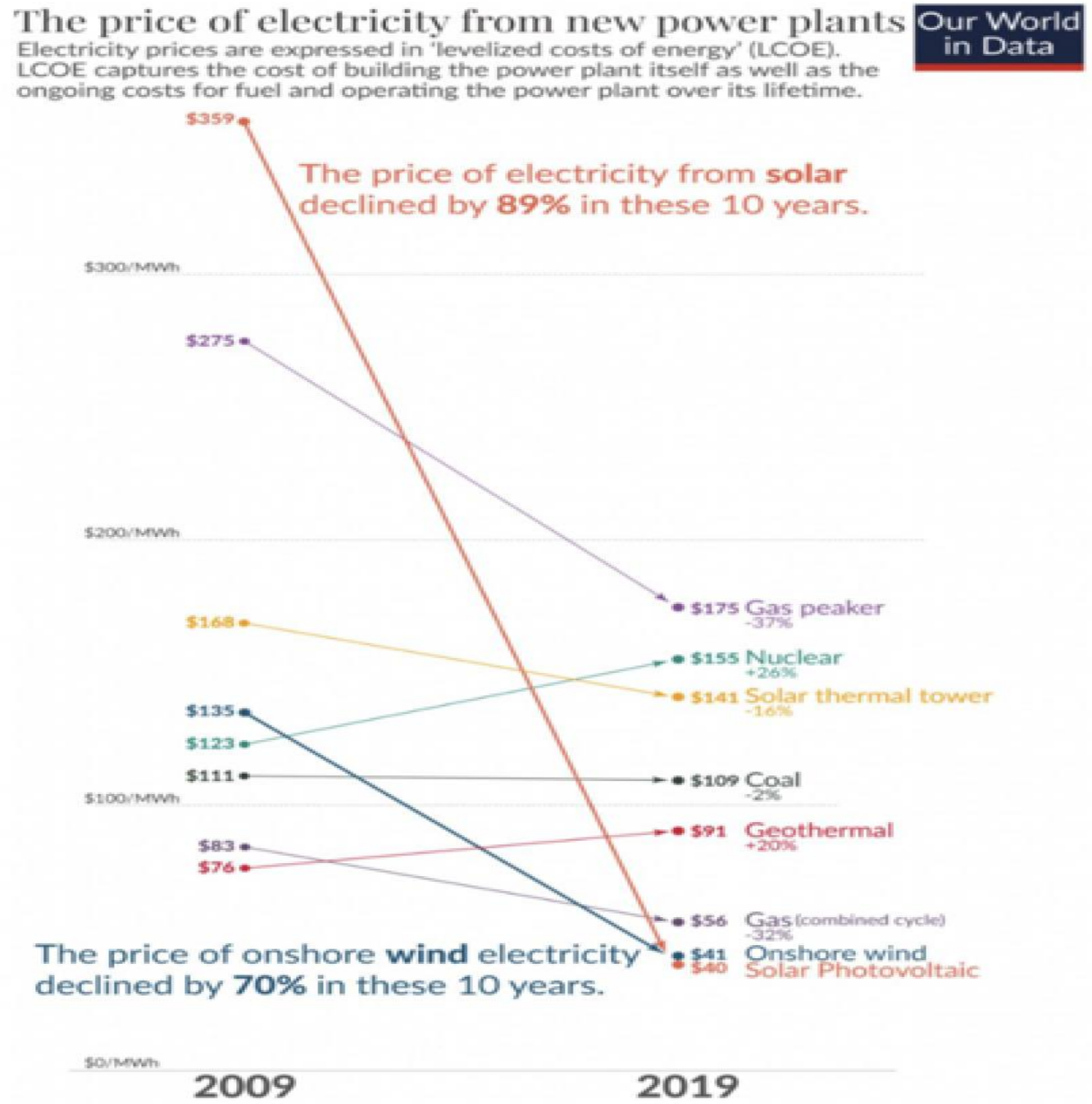
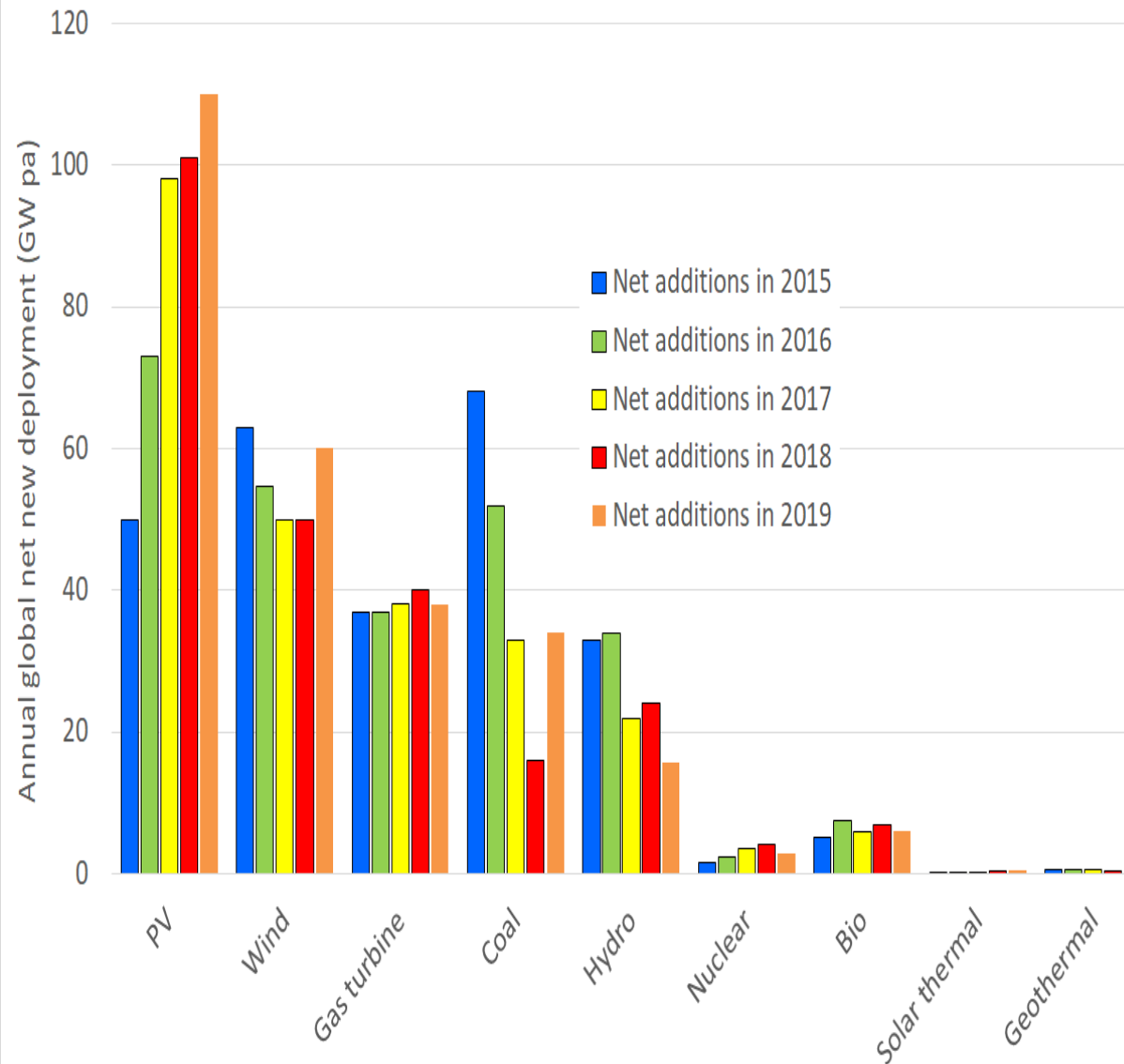


The INNOVATIONS....Ready to go as a Cluster

- RENEWABLES, especially solar and wind.
- BATTERIES,
- ELECTRIC VEHICLES, cars, transit, micro-mobility. 'Electric everything'.
- SMART CITY, integration.

Can buy from Bunnings... BUT HOW DO WE INTEGRATE THEM?

The solar transition is *now*



ELECTRIC VEHICLES NEXT...

EV's substantially increased market share in COVID.

Bloomberg NEF

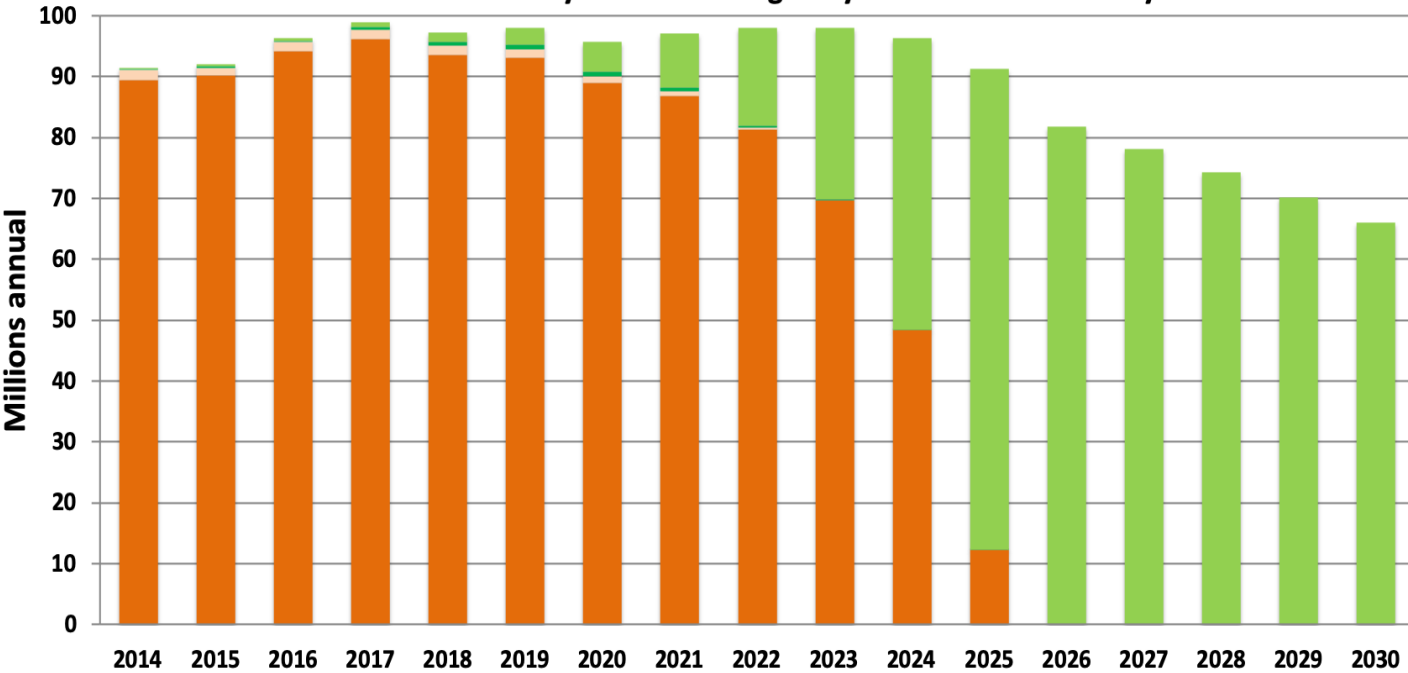
Micromobility grew 17% in 6 months



Transition to electric vehicles - global vehicle annual sales to 2018 projected to 2030

Vehicle data OICA; EV data 2014-2018 @InsideEVs & @IEA Chart & projection @FSS_Au @ProfRayWills updated 22Aug2019

ICE Vehicles Hybrid Plug-in hybrid EVs Battery EVs



Recharge Hubs for local area power AND electromobility

Electric cars may be able to support Australia's grid by end of 2020

FEBRUARY 26, 2020 · 3 MINUTE READ · BRIDIE SCHMIDT



Smart city transit

19. AUG 10
15:16

Du er cyklist nummer
6417
i dag

af sammenlagt
2447933
cyklistere i år på
denne strækning

I CPH

Let's bike it!
проект по развитию
велодвижения в России.
letsbikeit.ru

Public transport Taxi Cars Bike sharing

Sörmlän Sörster



3 Heide
2 ZKM-Siemensallee in 2 min
4 Waldstadt in 4 min
E ZKM-Kühler Krug in 7 min

How can TAC's help to integrate innovations into urban planning?

Cars and buses have been the solution on main roads until now....



240 Persons travel to work:

- in 177 Cars
- in 3 Busses
- in 1 Tram



TRANSIT AS GOOD AS RAIL BUT ON ROADS - fast mid-tier transit

THE TRACKLESS TRAM.....Electric. 70 kph. 300-500 people capacity



Battery Electric

No steel tracks

BUT

Optically guided tracks by GPS, LIDAR and sensors following white line.

Stabilization technology.





Delivering Integrated Transit,
Land Development and Finance
A Guide and Manual with Application to
TRACKLESS TRAMS

This research would not have been possible without the ongoing support of our core industry, government and research partners:



A GUIDE AND MANUAL WITH APPLICATION TO: TRACKLESS TRAMS - SEPTEMBER 2018



By Peter Newman, Mike Mouritz, Sebastian Davies-Slate, Evan Jones,
Charlie Hargroves, Rohit Sharma and David Adams

GUIDE
and
MANUAL
-
available

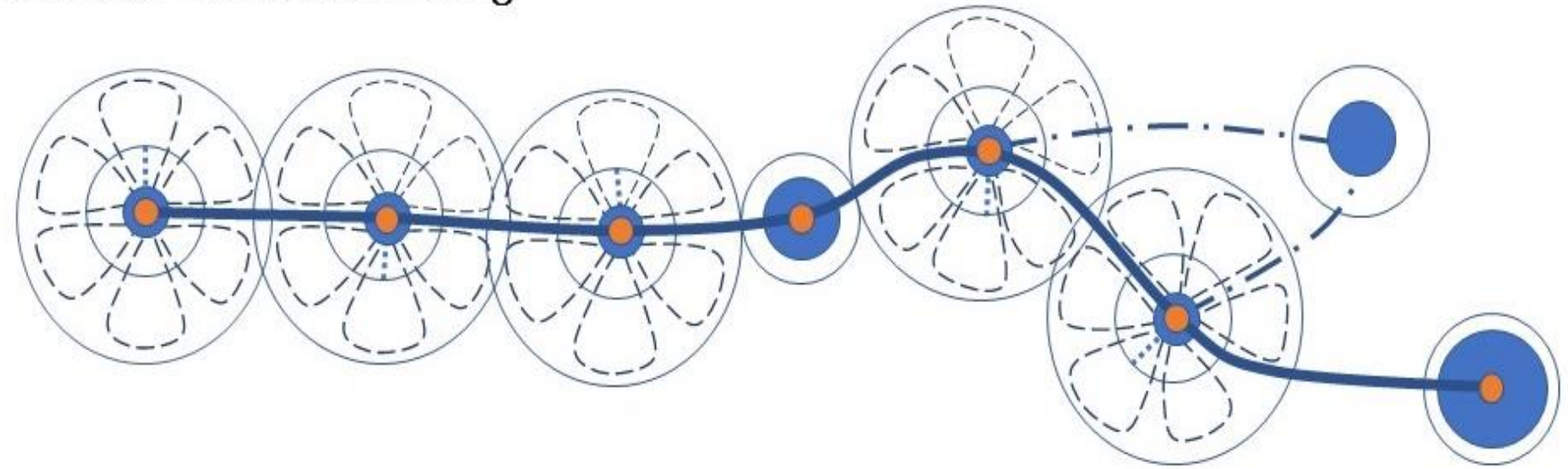
TRANSIT ACTIVATED CORRIDORS (TAC) 21st Century Boulevards

Rapid shared mobility and Local shared mobility feeding in at stations.... 50 kph then 20-30 kph in station areas

Micromobility feed-in, shared and private.

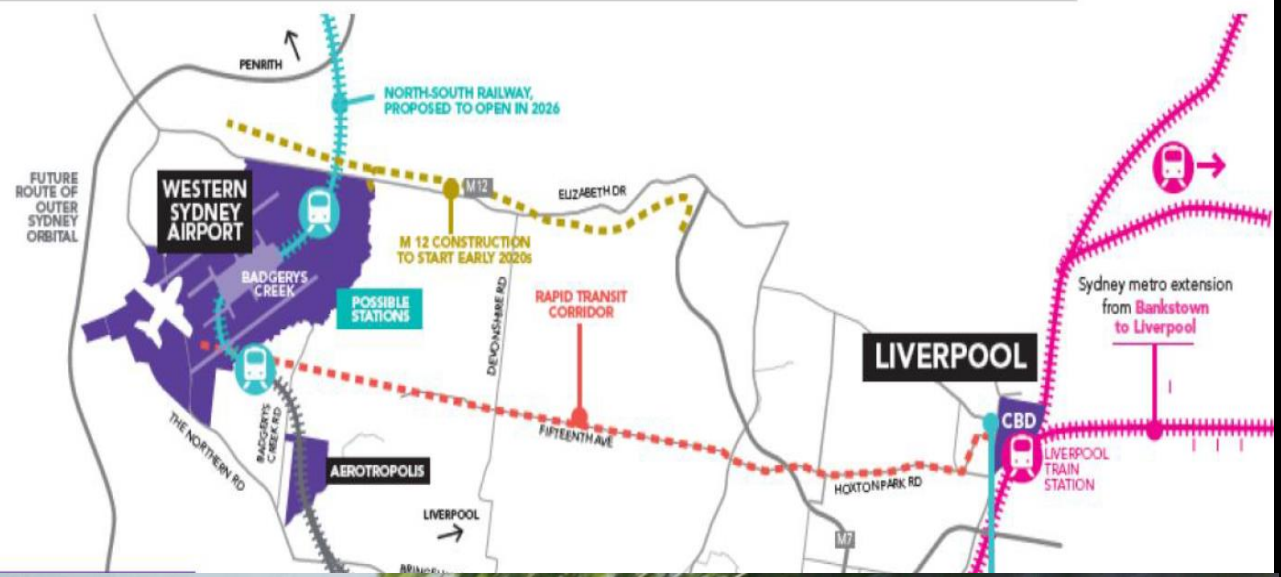


Corridor Transit Commuting



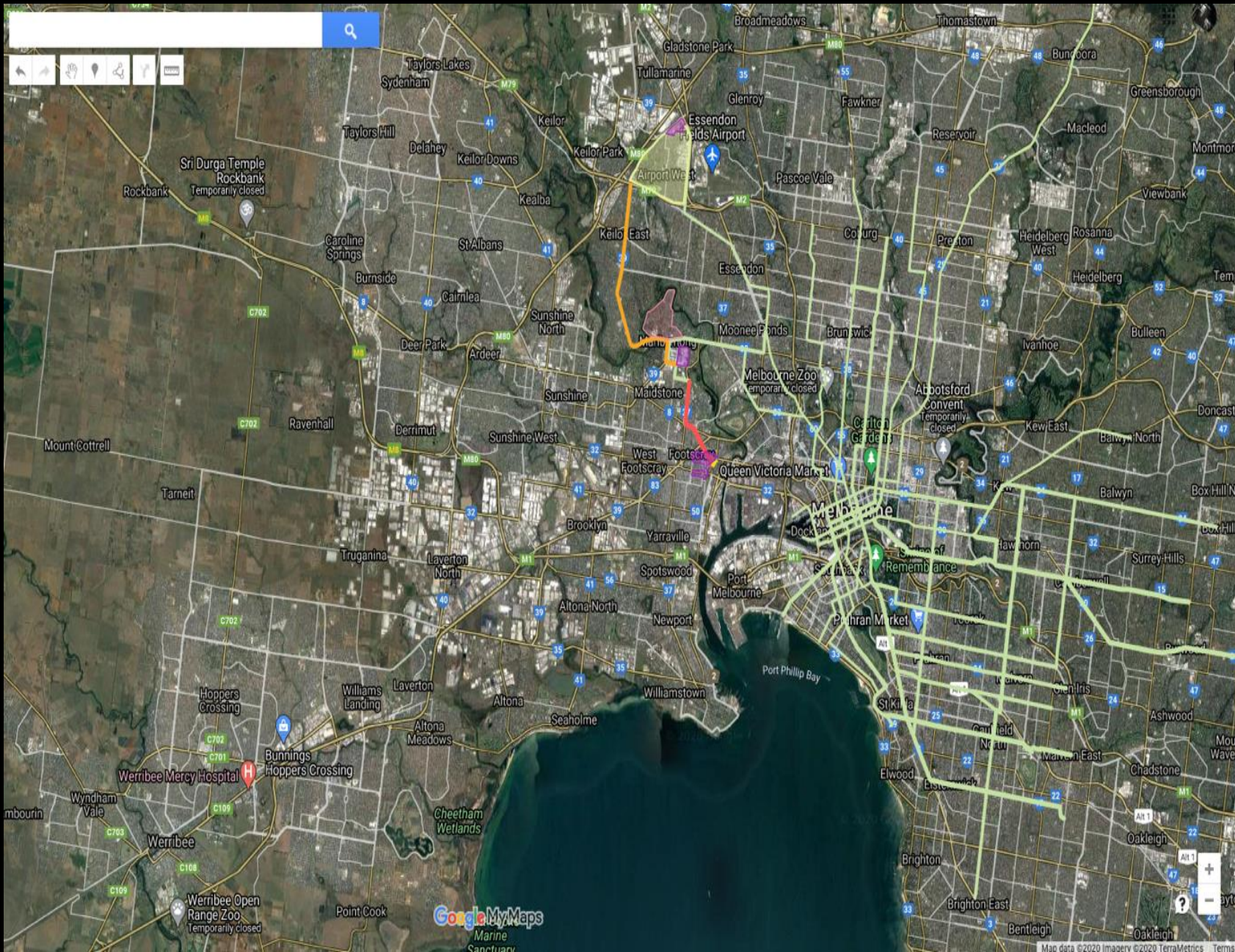
- Transit Line and Station
- Autonomous Feeder
- Autonomous Distributor
- Walking Trip
- Walking and Feeder Catchments

FIFTEENTH AVENUE CORRIDOR



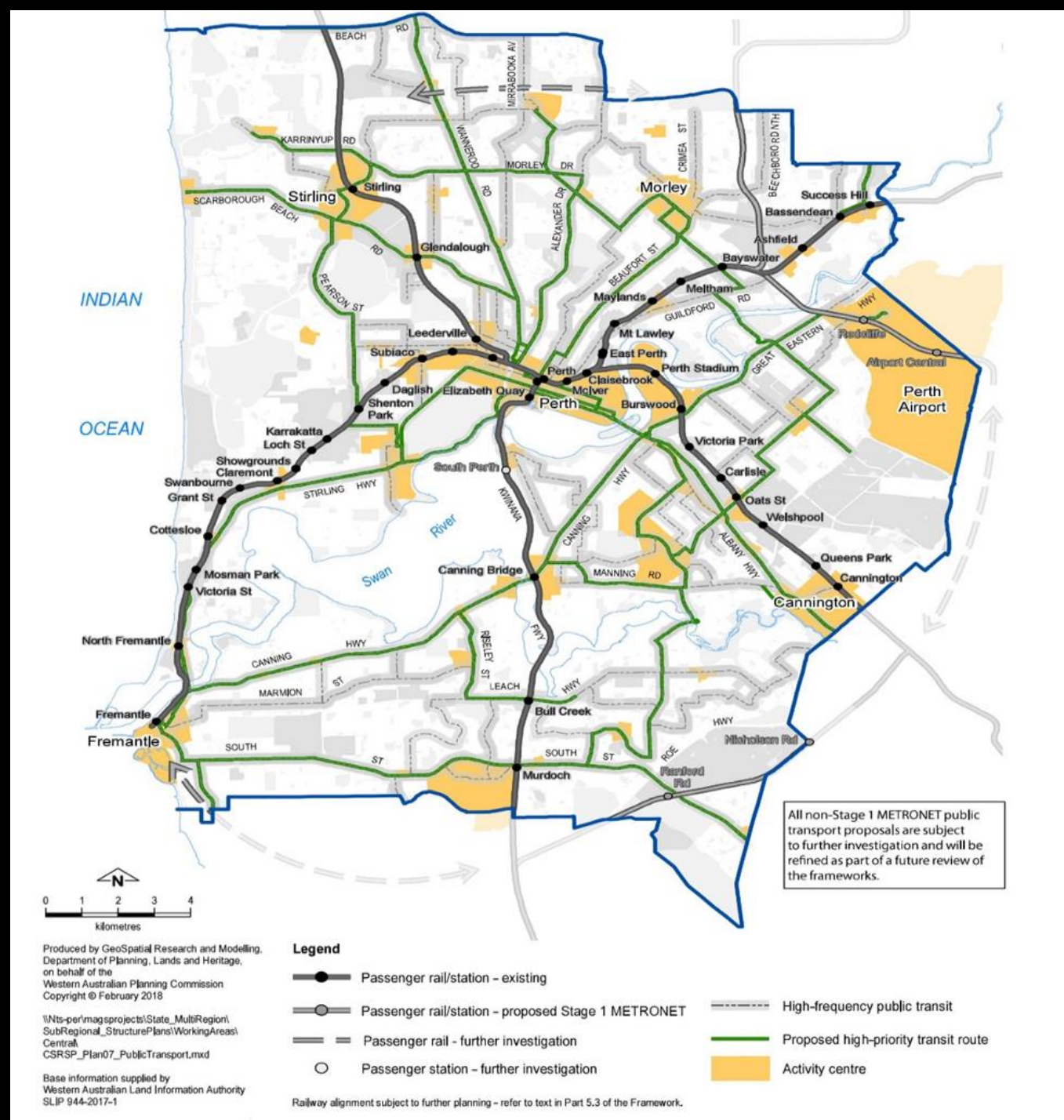
Liverpool TAC....

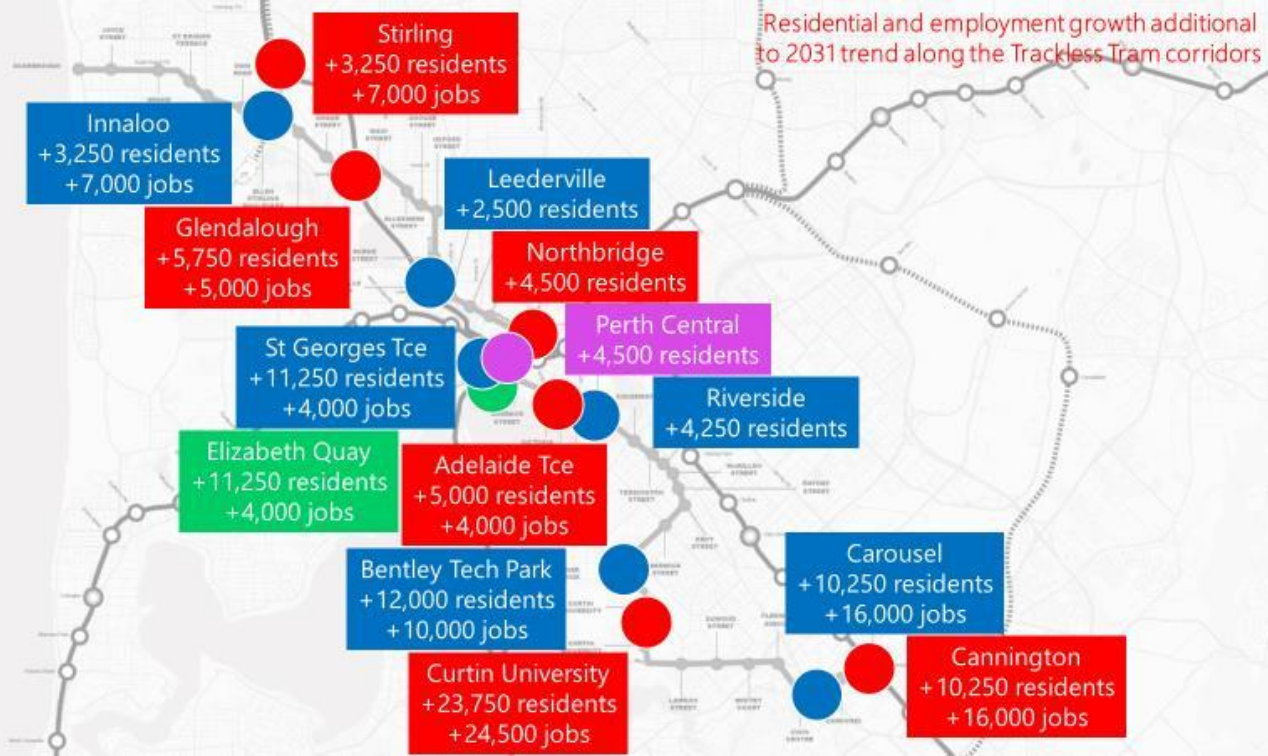




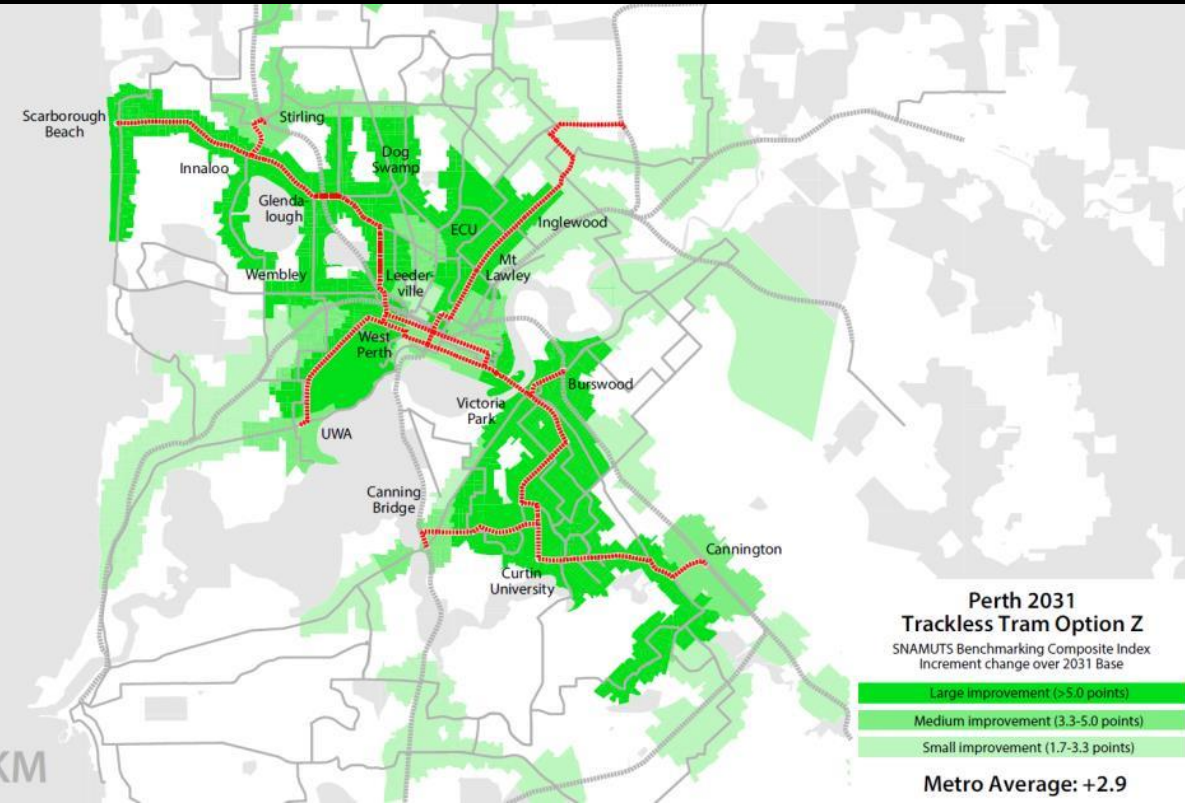
Integrated
Urban
Transport
needs mid-tier
transit

Green routes... Transit and Density priority...not car capacity Movement and Place





The first 21CB in Perth?





CONCEPTUALISING the NODES

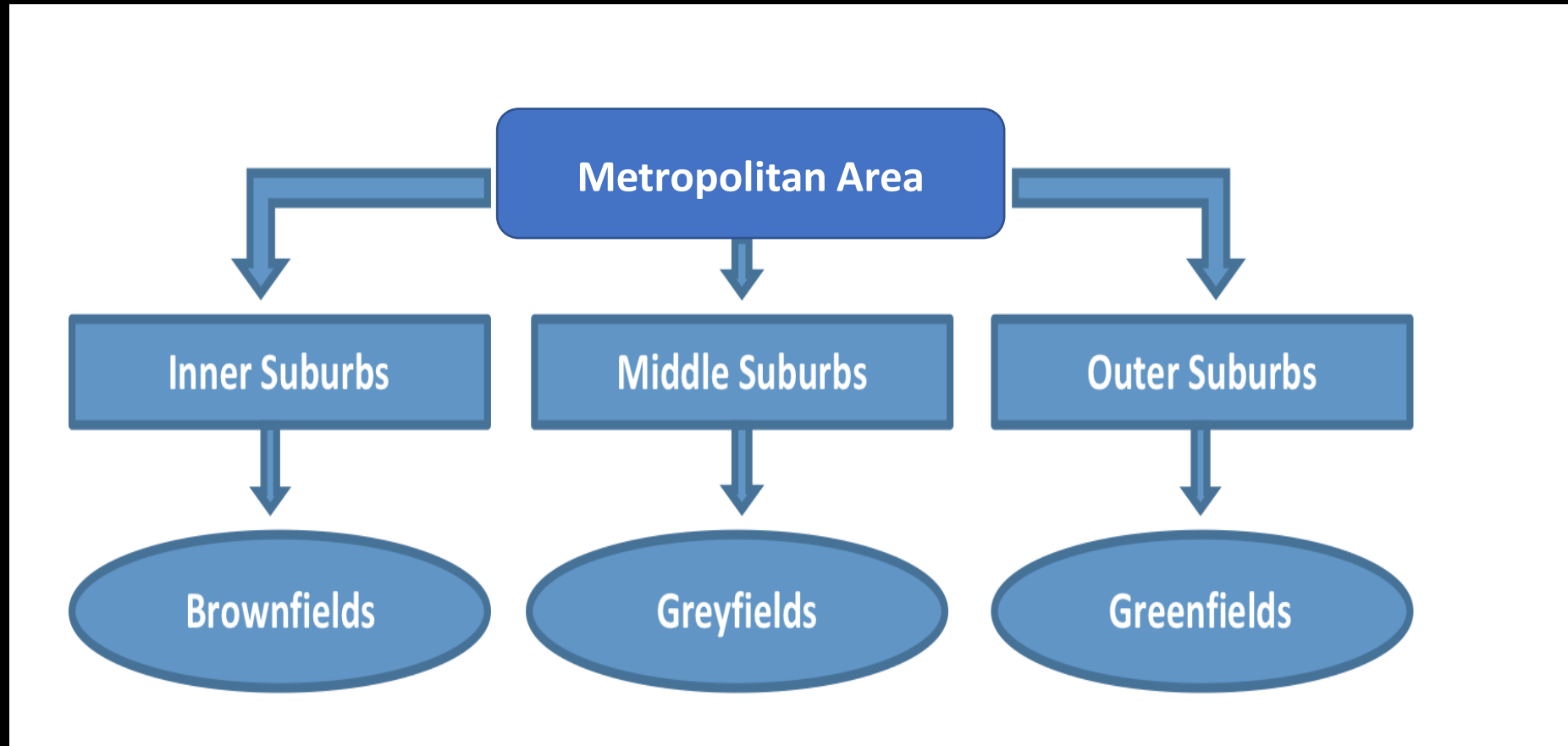
The remaking of Cecil Avenue

This is what most local governments are trying to build....

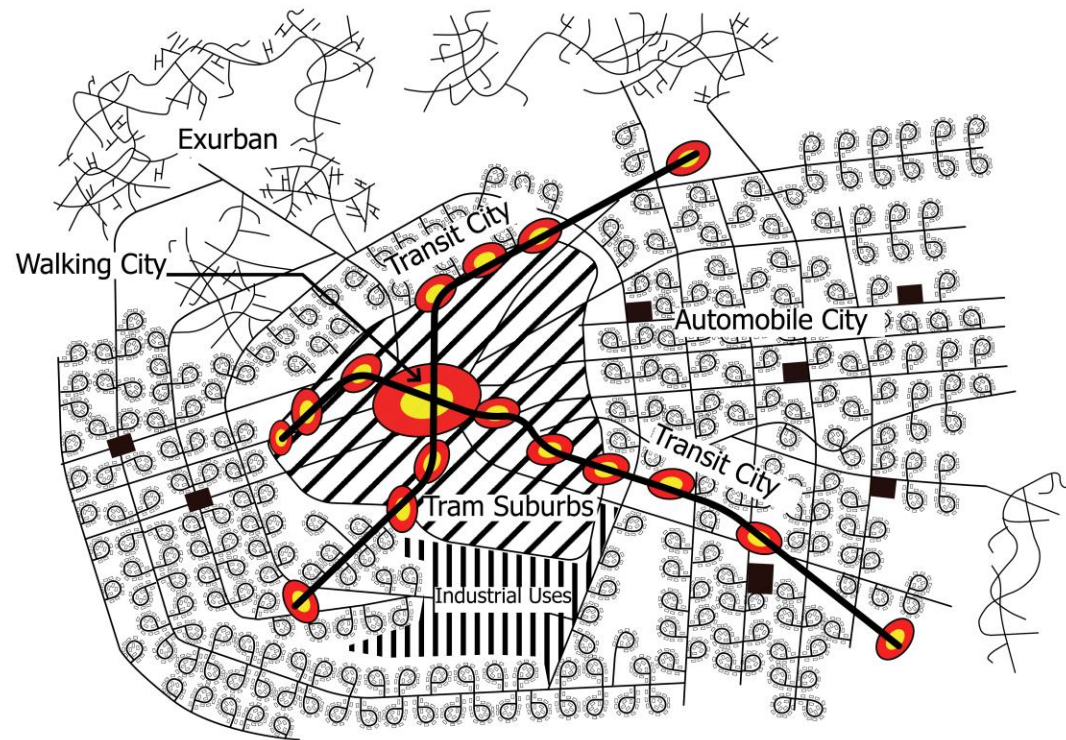
The TT makes it possible

TAC's are mostly in middle suburbs...why?

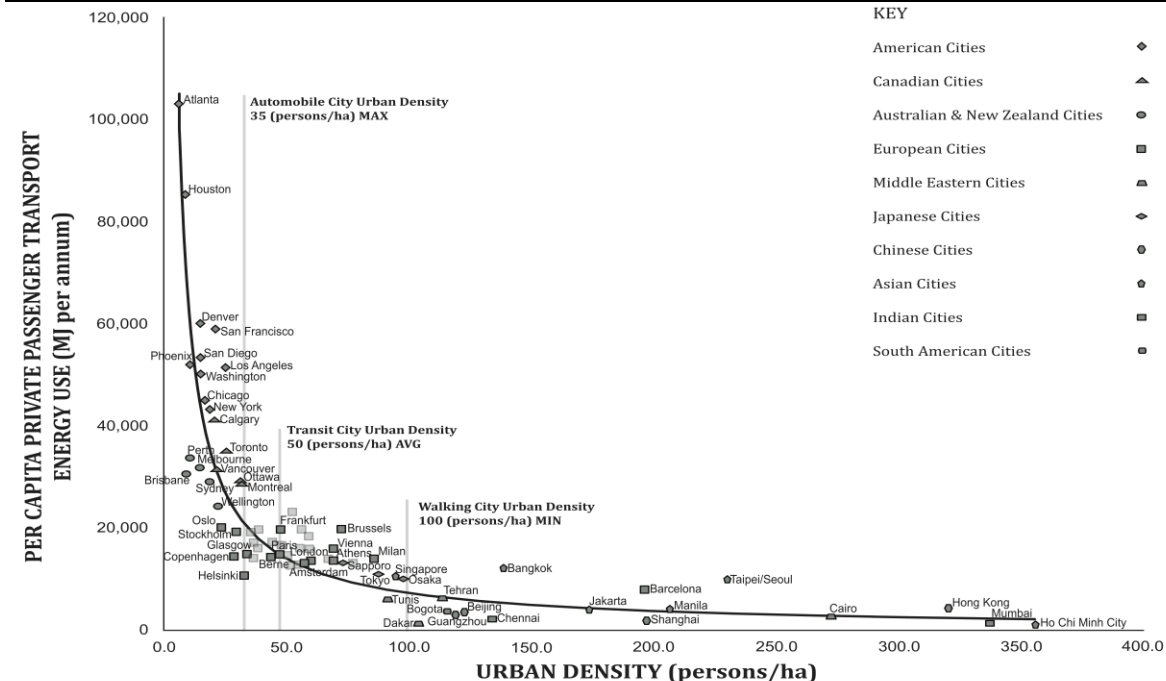
Greening the Greyfields...ideal for a TAC process to make infill into regeneration.



'Theory of urban fabrics' – three cities exist in all cities. ALL THREE NEED TO BE NET ZERO... TPR 2019



Walking City – 20 MJ per capita
 Transit City – 35 MJ per capita
 Automobile City – 50 MJ per capita



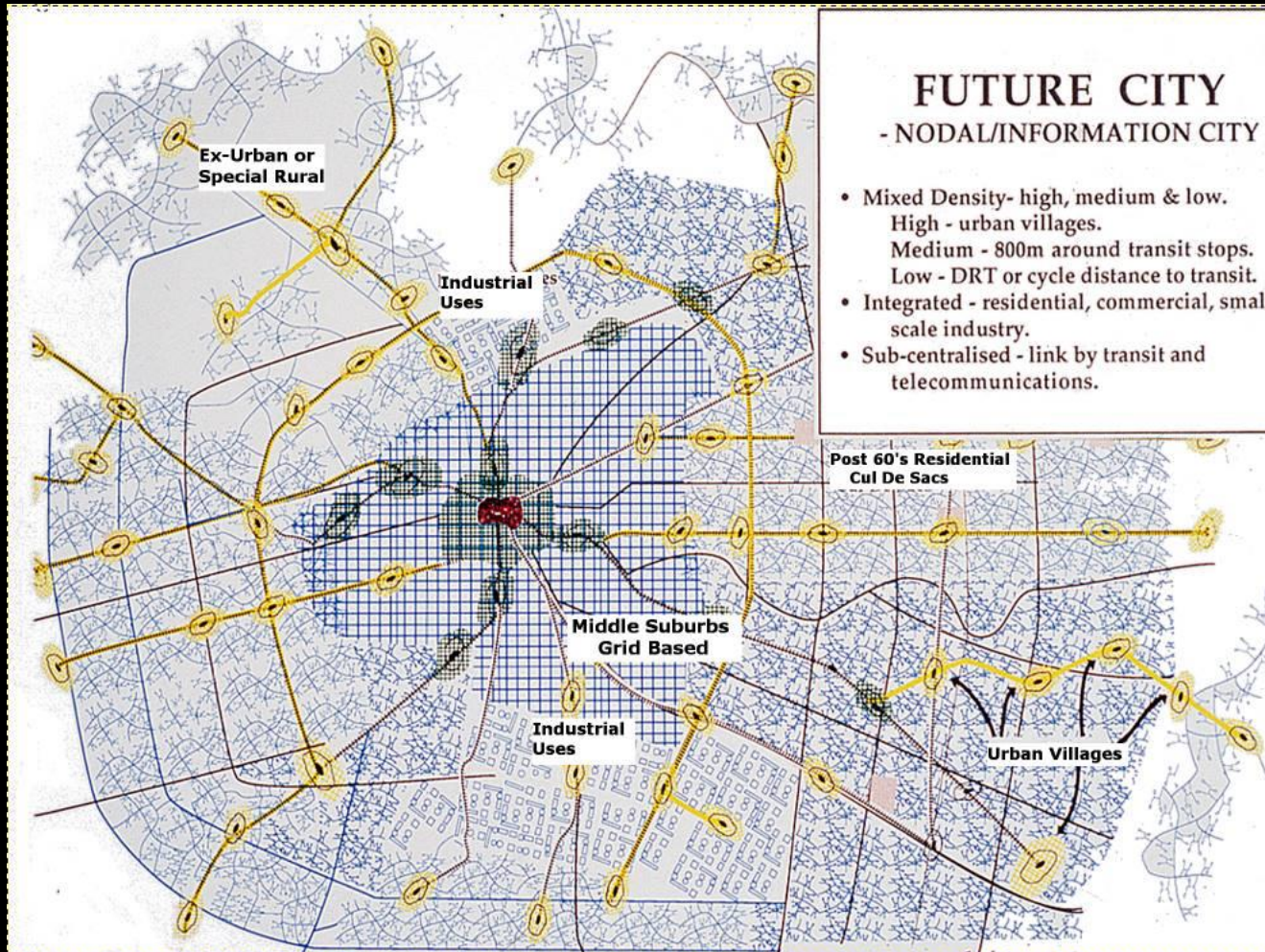
Importance of 'last mile linkage'....

Need to manage recharge point as part of overall precinct. How?



21st century POLYCENTRIC URBANISM

Relocalized centres with recharge hubs and microgrids that are linked by electric transit and local micromobility...

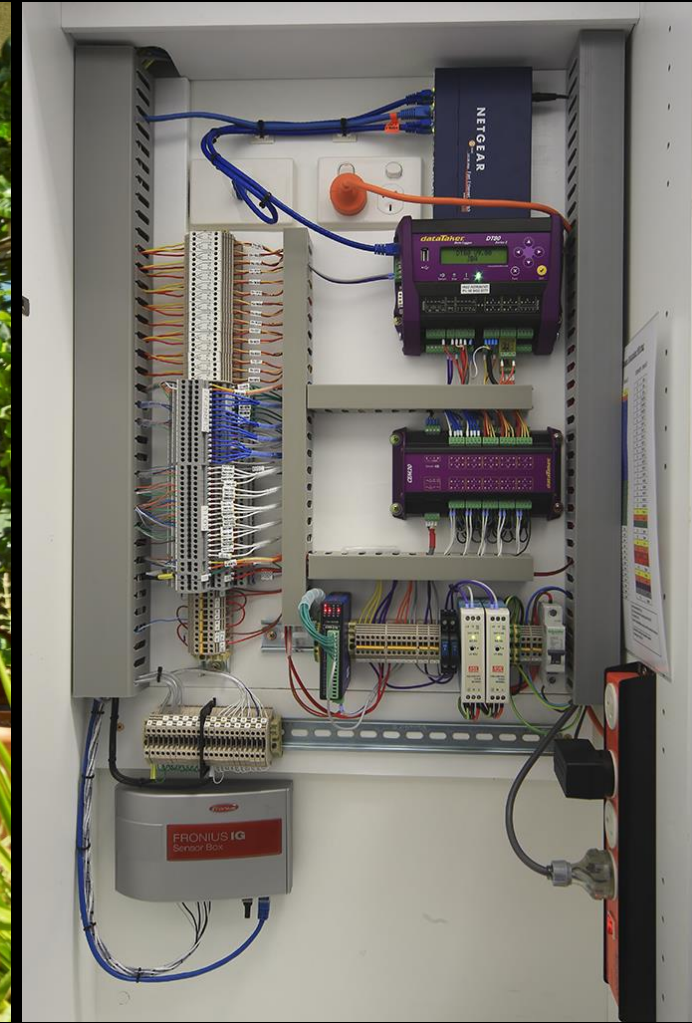


**Solar-electric scatter
or
solar-electric urbanism?**

How will we *manage* local distributed systems? Energy, water, electric vehicle recharge...

And other community values at a precinct scale like green infrastructure.....

Josh's House — where the story started. Net Zero through energy *and* water



Curtin University



JOSH BYRNE
& ASSOCIATES

ENERGY POSITIVE HOMES – Josh's House



Solar Generation & Storage - all paid for itself in 6 years



Electric Vehicle – all able to fit into a carbon neutral energy budget



Then **WGV – NET ZERO with SHARED SOLAR**

MULTI RESIDENTIAL, social housing
Solar-Battery-**Blockchain**-EV



Shared EV...



Then **Renew Nexus – P2P trial with community battery across a local government with 50 households**

- P2P trading popular with participants.
- Cheaper.
- Energy trading altered energy habits.
- Can work wherever a community can be formed.



Image supplied by the City of Fremantle

Then...East Village

Fully integrated innovative village with:

- zero carbon solar-based buildings,
- shared EV with high rate charging,
- low water,
- low waste,
- using blockchain to share the value in these efficiencies....

58 The West Australian
INSIDE P59
PROPERTY
Perth 9482 7752 South Australia 8466 6666
Edited by Ben Warner



Fremantle mayor Brad Pettitt, Power Ledger's Jenna Green and Josh Byrne from Curtin University watch Ben Wyatt load a solar-powered mini.

East Village to lead way

SEAN SMITH

WA energy trading platform Power Ledger is collaborating with government in a sustainable community development in Fremantle, which has its own power and water microgrid and a shared on-site battery.

State-owned developer LandCorp says its 1.5ha East Village at Knutsford project will lead the way in sustainable WA housing, helping meet the growing challenges of addressing natural resources and climate change.

Treasurer and Lands Minister Ben Wyatt, who helped launch the project yesterday, said the East Village "demonstrates to the wider construction industry

rather than selling back to the traditional grid," the company's managing director and co-founder David Martin said.

Mr Martin said East Village, part of the Federal Government's Smart Cities and Suburbs initiative, again showed how the property industry "is in a unique position to drive energy change from the ground up."

"This project highlights how developers can choose to make smarter, more efficient choices when it comes to homes," he said.

Taking its lead from LandCorp's already developed One Planet Community in White

Battery unit. Pictures: Steve Ferrer

just what is possible in creating connected and affordable communities".

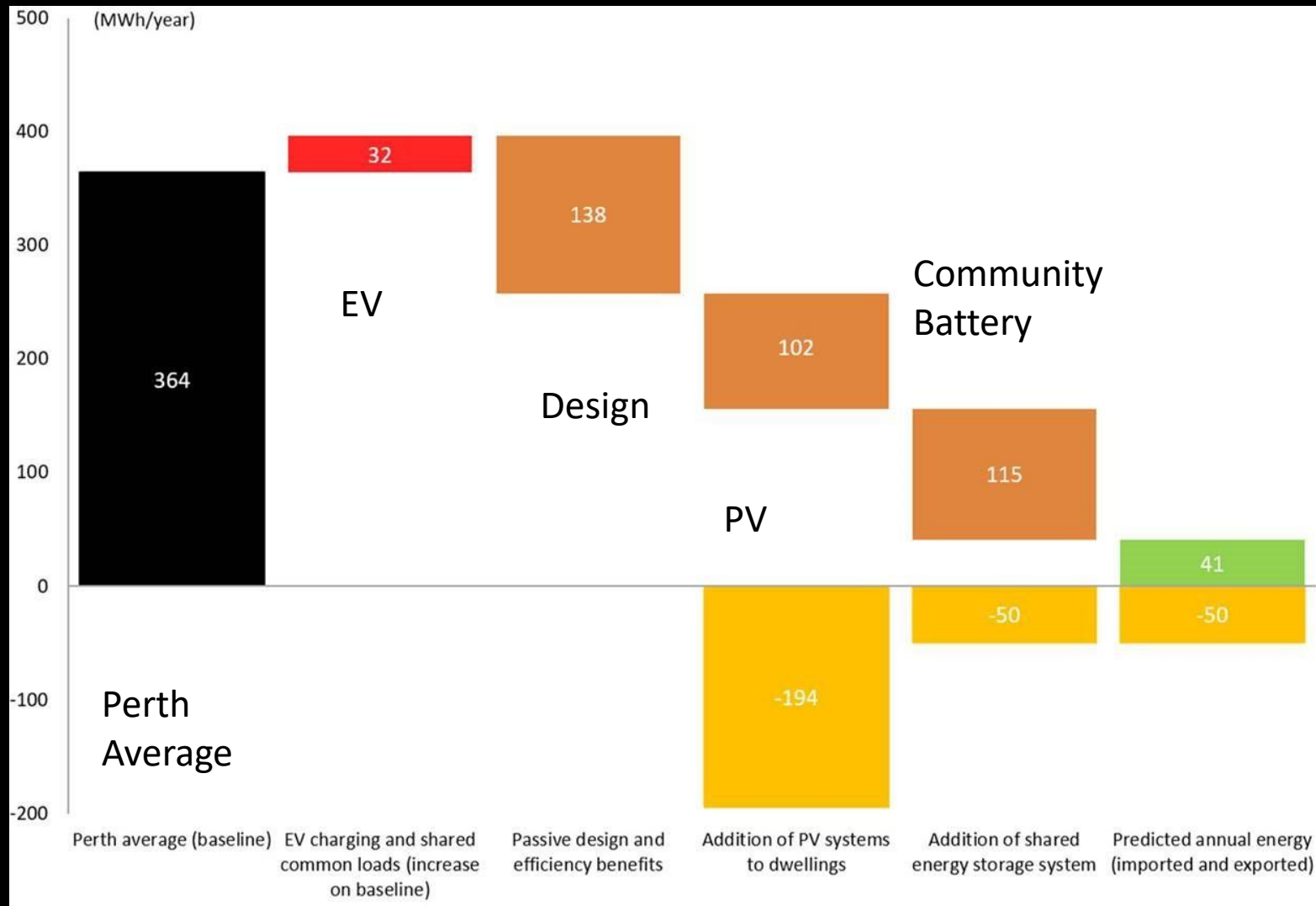
Focused on a former industrial estate near the Royal Fremantle Golf Club, 3.5km east of Fremantle, the development of 36 townhouses will be powered by renewable energy,

using individual 5kW PV solar systems and a shared 60kW battery provided by Power Ledger to store surplus energy.

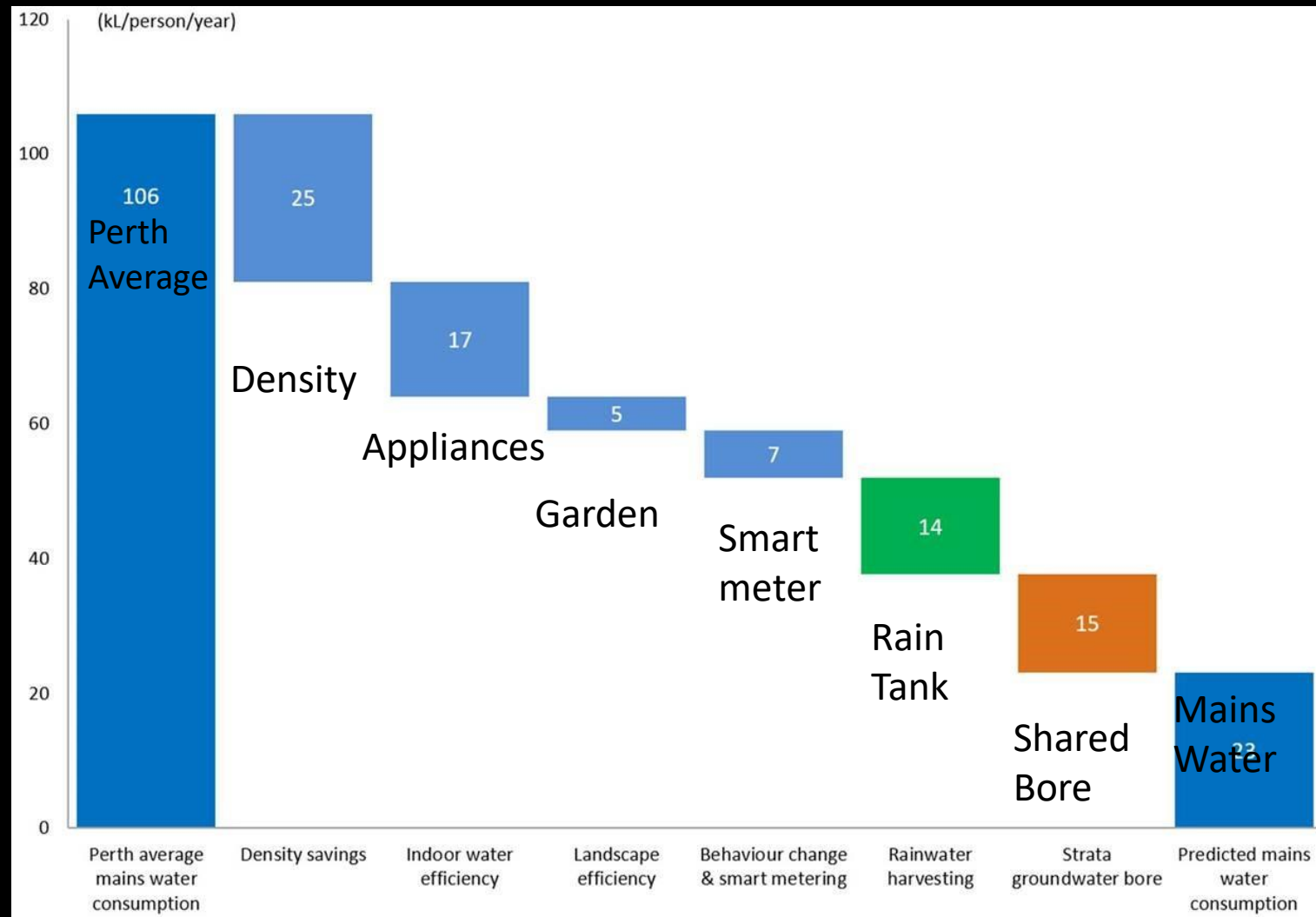
"Power Ledger's platform allows residents to sell excess solar power from the panels on their roofs directly to their neighbours at a better price,

2.103HA*
1.9 KM
5.7 KM
Unprecedented Opportunity
100% interest in five free
Barragoon Rd, Moore River

Projected Energy Use (per household) 80% reduction, 20% less



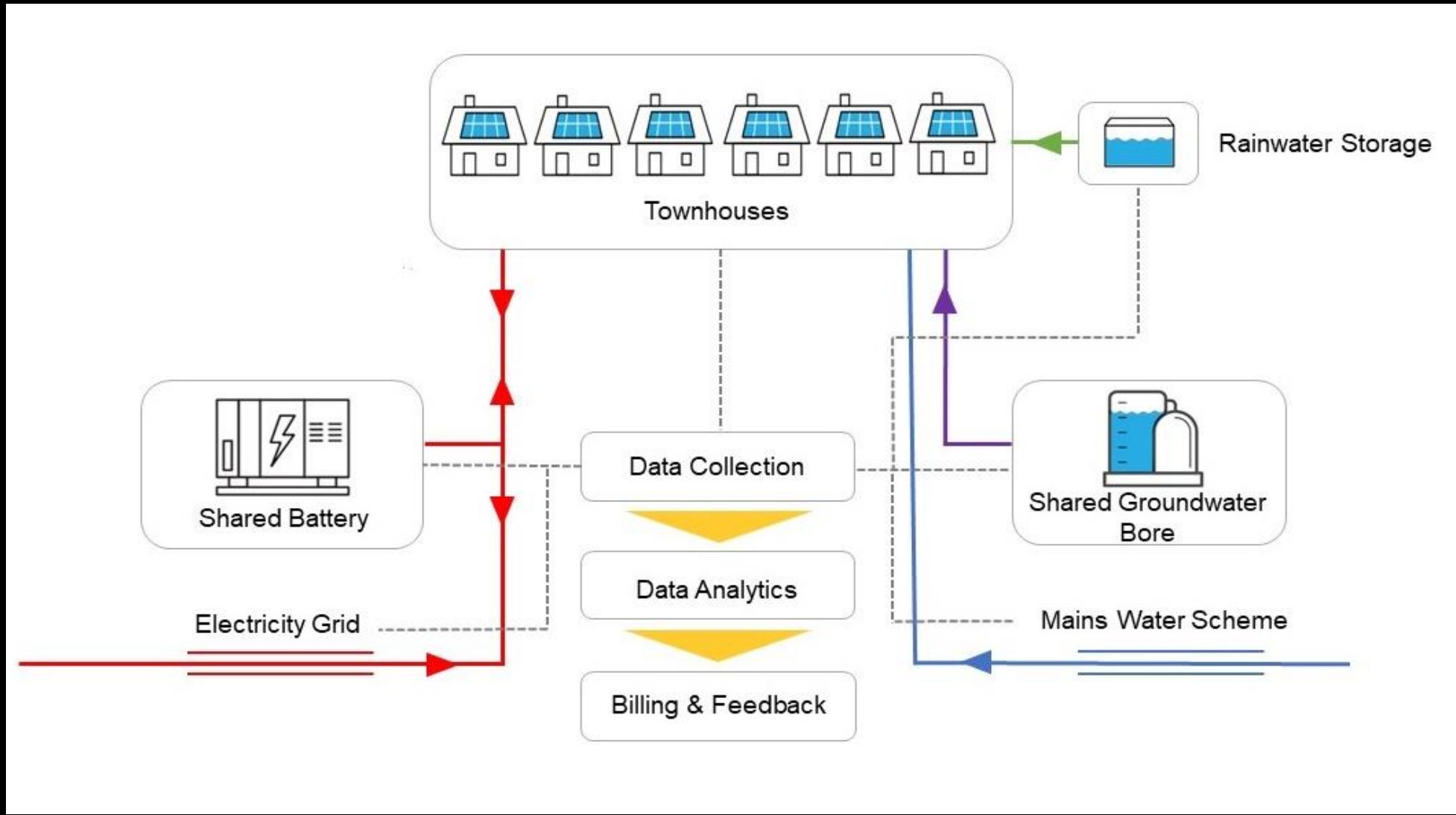
Projected Water Use (per person) – 80% less mains water, 50% less cost



Precinct Groundwater Scheme – shared bore, shared battery



Embedded Network – managed locally with blockchain



The sharing economy vision

- **Sharing Cities Network** - People-powered solutions for the common good
- 40 cities with sharing network maps
- **The new basis for local governance in our Net Zero cities?**
- **How can urban planning facilitate this?**

