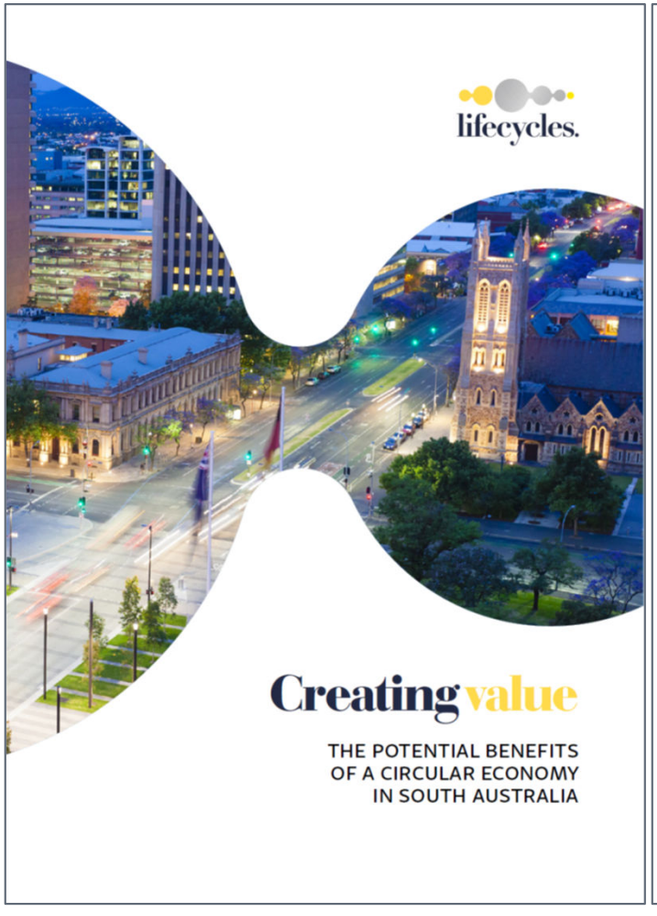
Launching a new approach…

Driving circularity in infrastructure delivery


LEVEL
5
DESIGN



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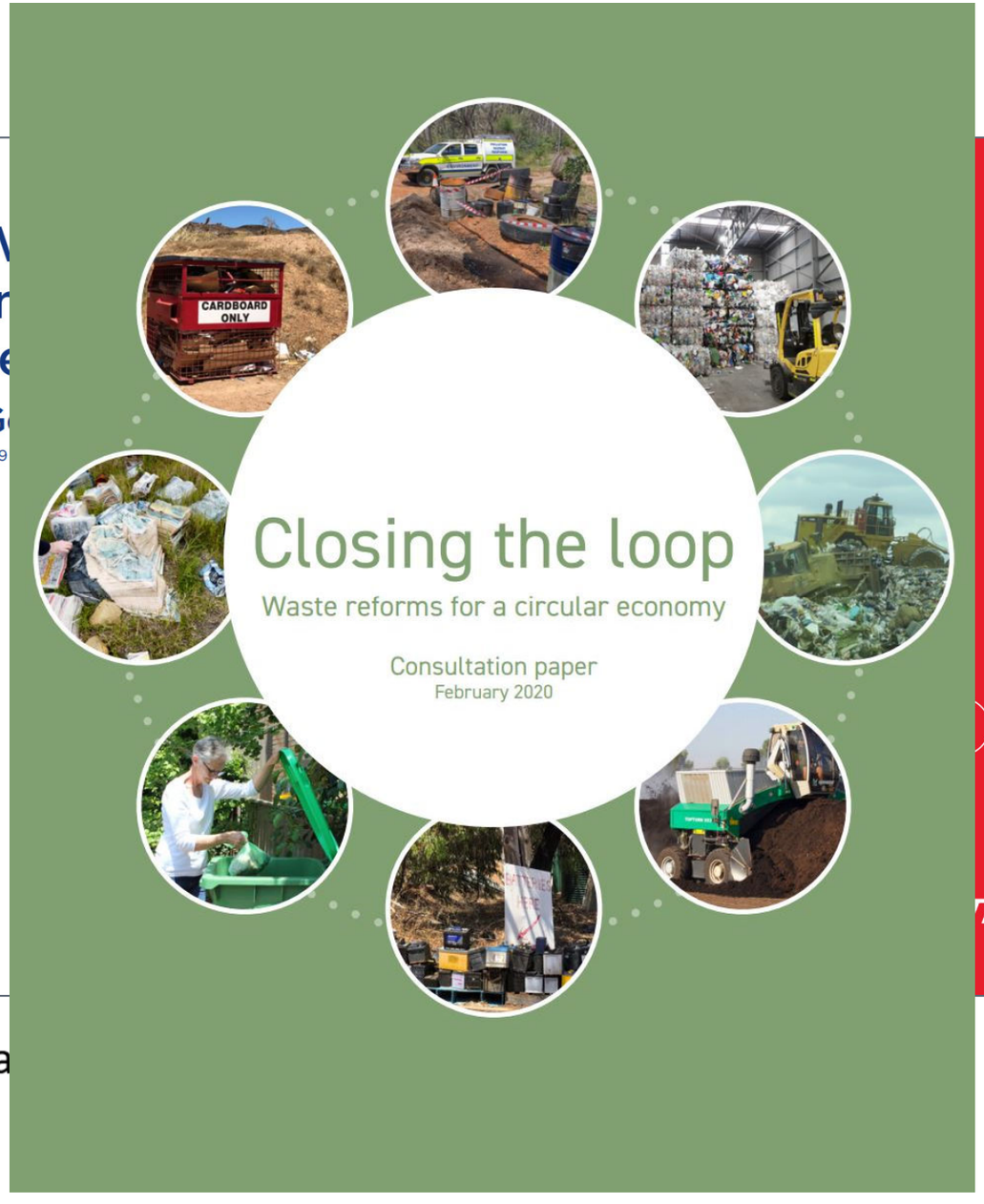
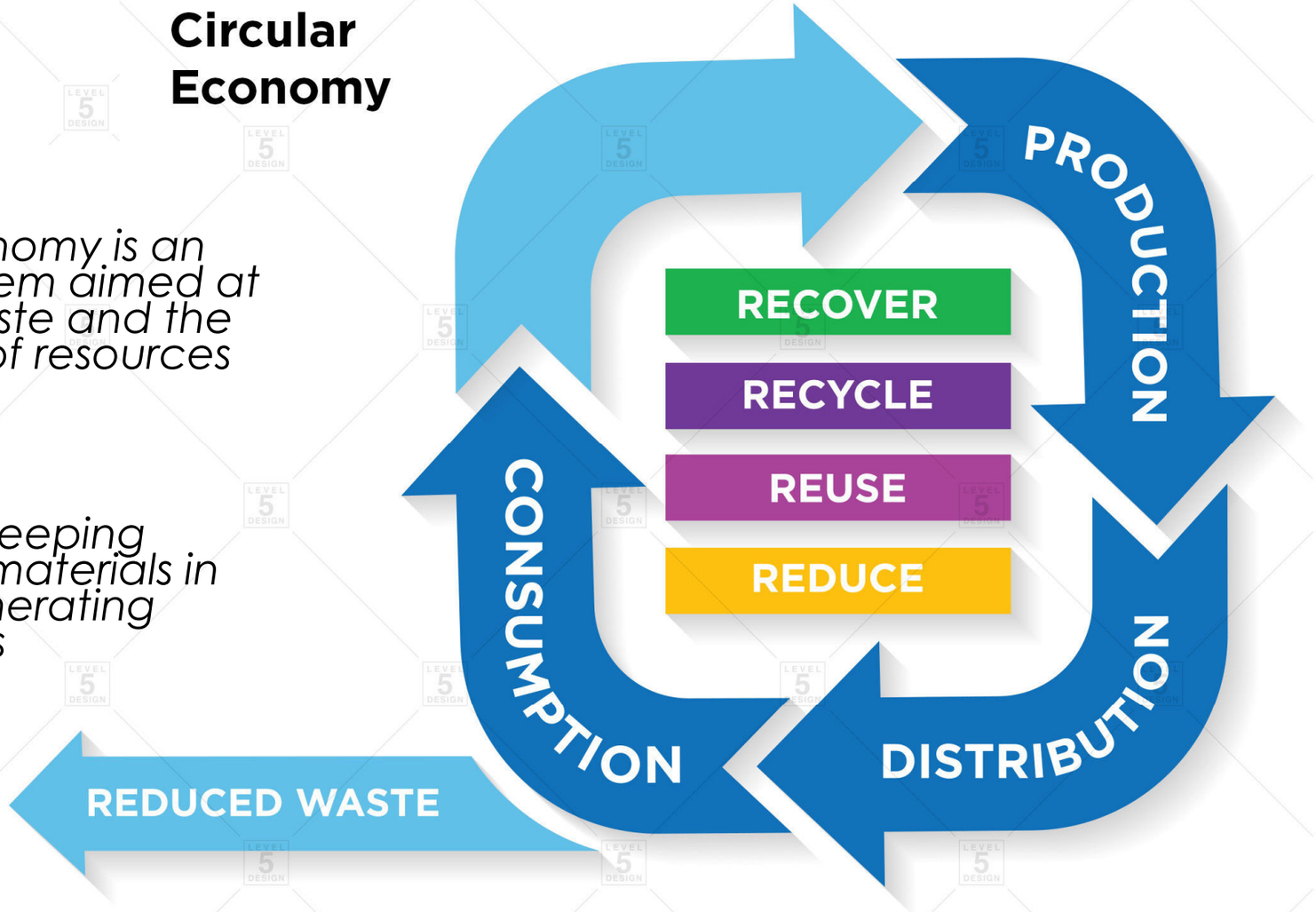


July 2019

Circular Economy

A circular economy is an economic system aimed at eliminating waste and the continual use of resources

It is based on keeping products and materials in use, and regenerating natural systems



UN Sustainable Development Goals

Sustainable Procurement

- Minimise adverse impacts
- Recycled content / recyclable
- UN SDG 12 – responsible consumption and production

Environmental impacts	Social impacts	Economic impacts
eg. inputs of natural resources, energy and water in the manufacture, use and disposal of goods	eg. labour conditions in the manufacture, use and disposal of goods or delivery of services	eg. costs of operation and maintenance over the life of the goods

HAZARD vs RISK

A HAZARD is something that has the potential to harm you

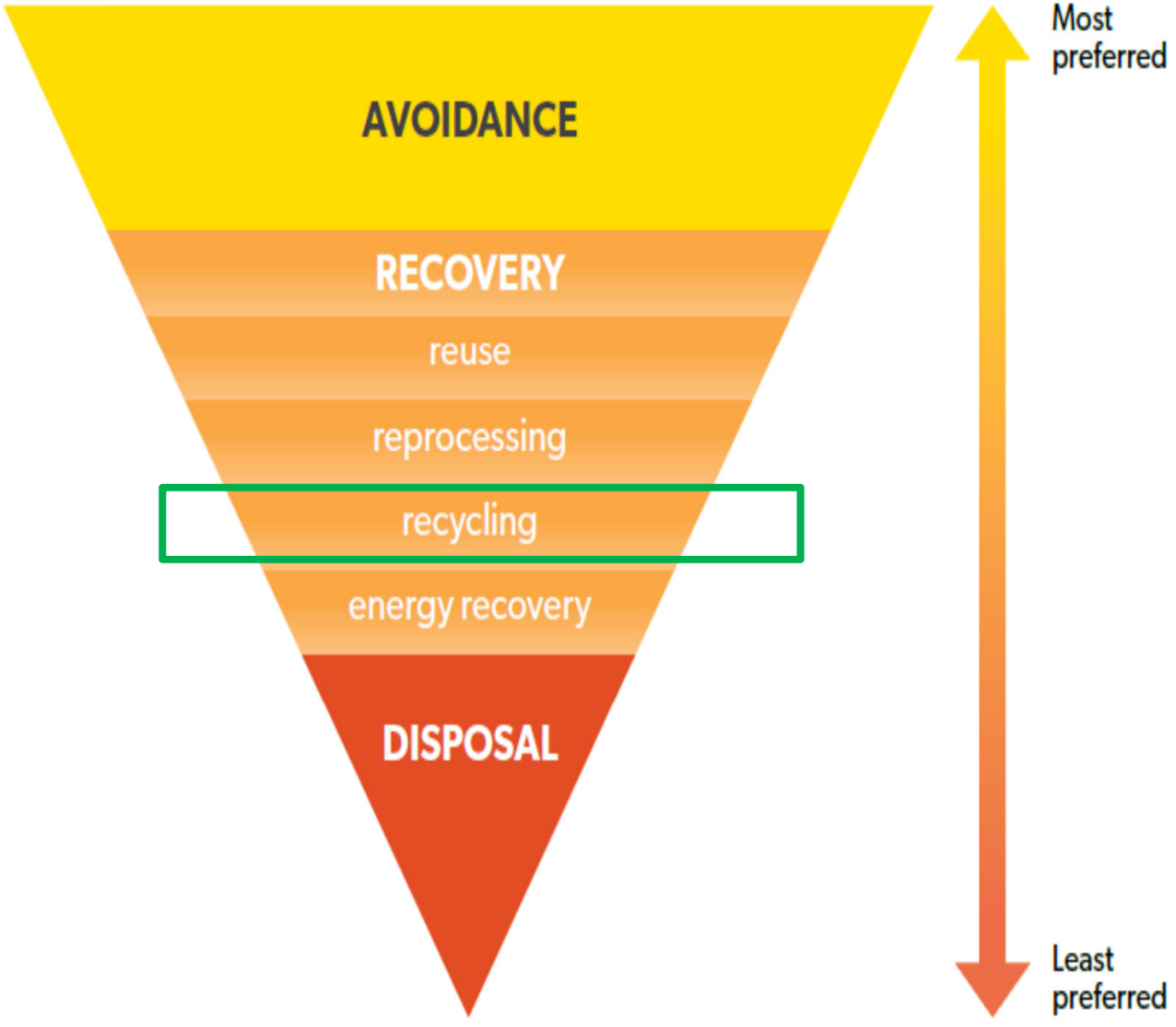
RISK is the likelihood of a hazard causing harm

Main challenges

lack of confidence in the quality of recycled materials.

uncertainty about the potential health risk for workers using recycled materials.

Waste Hierarchy and Source Separation



The way to get to "*Towards100*"

Why not have recycled material rather than Why?

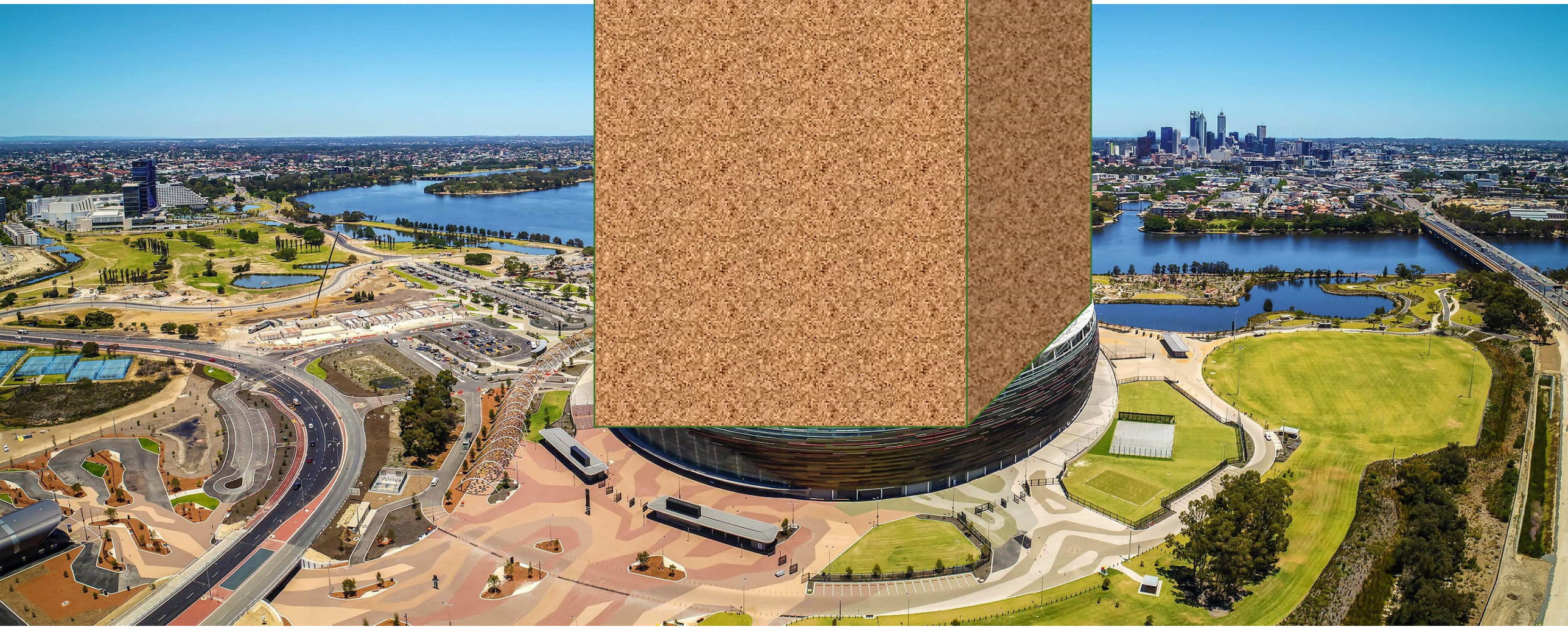
Opportunities

Let’s consider the following beneficial waste streams:

- Organics
- Concrete, brick and tiles
- Reclaimed asphalt product (RAP)
- Glass
- Rubber
- Plastic
- Wastewater
- Recycled sand and recycled rock
- Toner ink, flyash, slag, recycled oil…

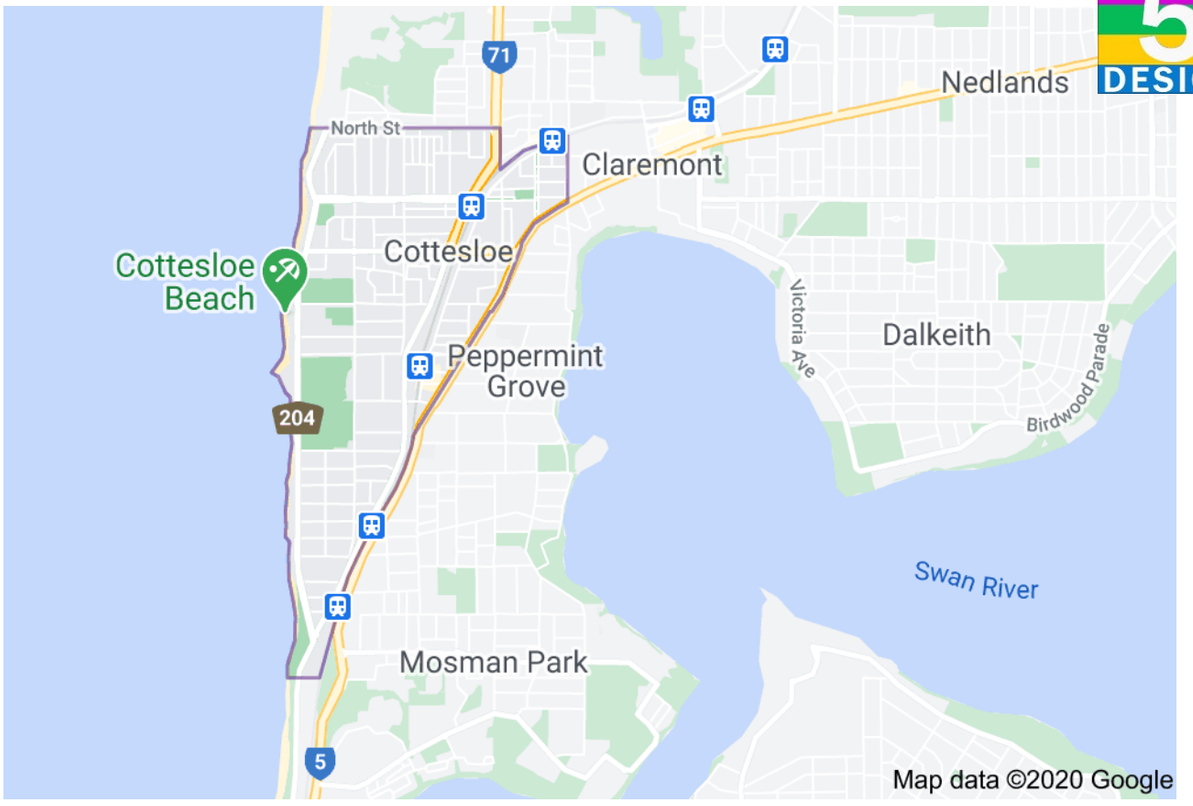
So why does this matter?

Enough imported materials to completely fill Optus Stadium 1 km into the sky



Equivalent of 80,000,000 glass bottles

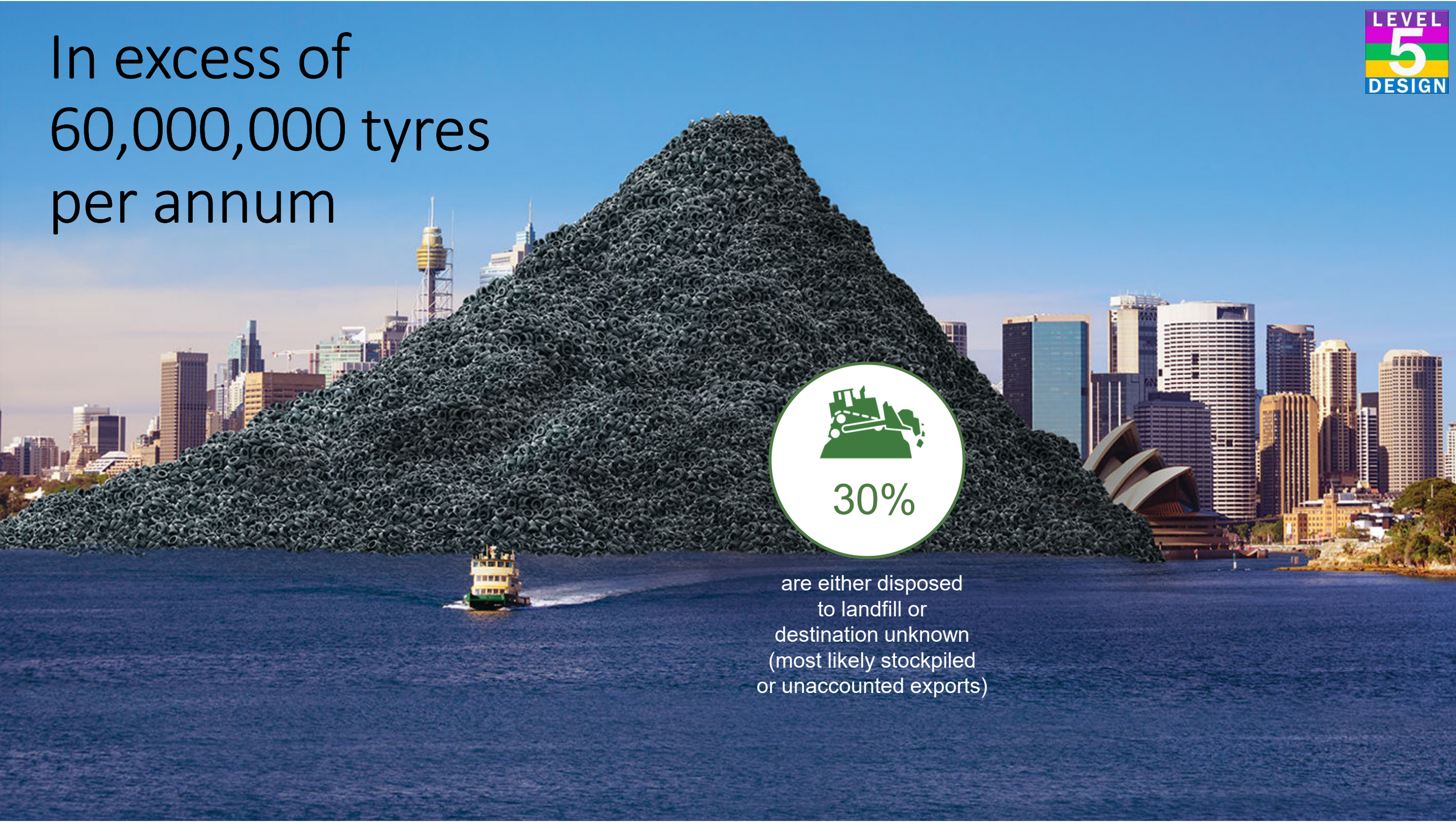
Equivalent of millions of plastic bottles



How to maximise recycled content?

- An Olympic swimming pool of water used every day
- Enough asphalt and surfacing to cover most of the Town of Cottesloe

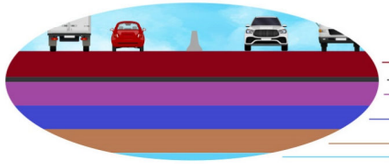
In excess of 60,000,000 tyres per annum



30%

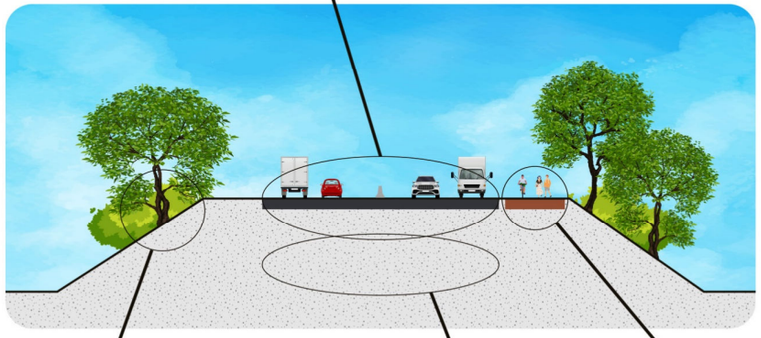
are either disposed
to landfill or
destination unknown
(most likely stockpiled
or unaccounted exports)

Opportunities



- Asphalt: RAP, CRC, Crumb Rubber
- Spray seal: Crumb Rubber, Recycled Aggregates
- Base: CRC, C&D
- Sub-base: C&D, Waste Water for Compaction
- Compacted Sub-grade: C&D, CRC, RCG (where above design flood level), Waste Water for Compaction
- Capillary break: RCG

Decorative Recycled Glass in Noise Walls, Paths and Concrete Paving

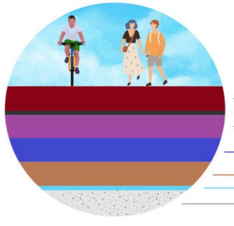


Recycled Plastic Geogrid Mesh

CRC, RCG, Recycled Plastics and Rubber in Noise Walls

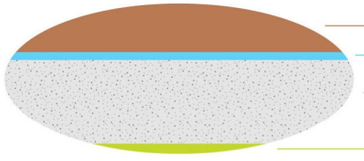
Recycled Aggregates in Precast Concrete: CRC, RCG, Recycled Plastics, Rubber

Old Tyres for Slope Stability



- Asphalt: RAP, CRC, Crumb Rubber, Recycled Plastics
- Spray Seal: Crumb Rubber, Recycled Plastics, Recycled Aggregates
- Base: CRC, C&D
- Sub-base: C&D, Waste Water for Compaction
- Compacted Sub-grade: C&D, RCG (where above design flood level), Waste Water for Compaction
- Capillary Break: RCG as Drainage Layers to Stop Capillary Rise
- Recycled Fill Material (Recycled Sand), Waste Water for Compaction

- FOGO Mulch
- FOGO Compost
- Recycled Fill Material (Recycled Sand), Waste Water for Compaction



- Compacted Sub-grade: C&D, CRC, RCG (where above design flood level), Waste Water for Compaction
- Capillary Break: RCG as Drainage Layers to Stop Capillary Rise
- Recycled Fill Material (Recycled Sand), Waste Water for Compaction
- Natural Ground Level

Our focus and intent

FOCUS ON BRINGING A MORE UNIFORM APPROACH TO THE EXISTING ‘AD HOC’ USE OF RECYCLED PRODUCTS ON MAJOR INFRASTRUCTURE PROJECTS AND ON A NEW PHILOSOPHY OF *TOWARDS100* WHERE WE MUST ASK OURSELVES *‘WHY NOT’* RATHER THAN *WHY?*

TURN WASTE INTO VITAL VALUE-ADDED MATERIALS FOR OUR HUGE INFRASTRUCTURE AGENDA AND TO GET RUBBISH OUT OF LANDFILLS.

BOOST THE DEMAND FOR REUSED AND RECYCLED MATERIALS RIGHT ACROSS OUR PROJECTS – DRIVING INNOVATION IN SUSTAINABLE MATERIALS AND CHANGING THE WAY WE THINK ABOUT THE USE OF WASTE PRODUCTS IN OUR INFRASTRUCTURE.

THE *RECYCLED FIRST* INITIATIVE SHALL INCLUDE STRICT QUALITY AND SAFETY STANDARDS AND CONFORMS WITH THE RTR ENVIRONMENTAL SPECIFICATION.

Rapid implementation

Pivot rapidly

- Adopt the wins of others and learn from them
- Leapfrog others
- Drive market desired behaviours to improve outcomes – best for community
- Legitimise the move to larger volumes
- Gather the knowledge and apply it elsewhere
- Mainstream through a program of projects

RECYCLE FIRST PLAN

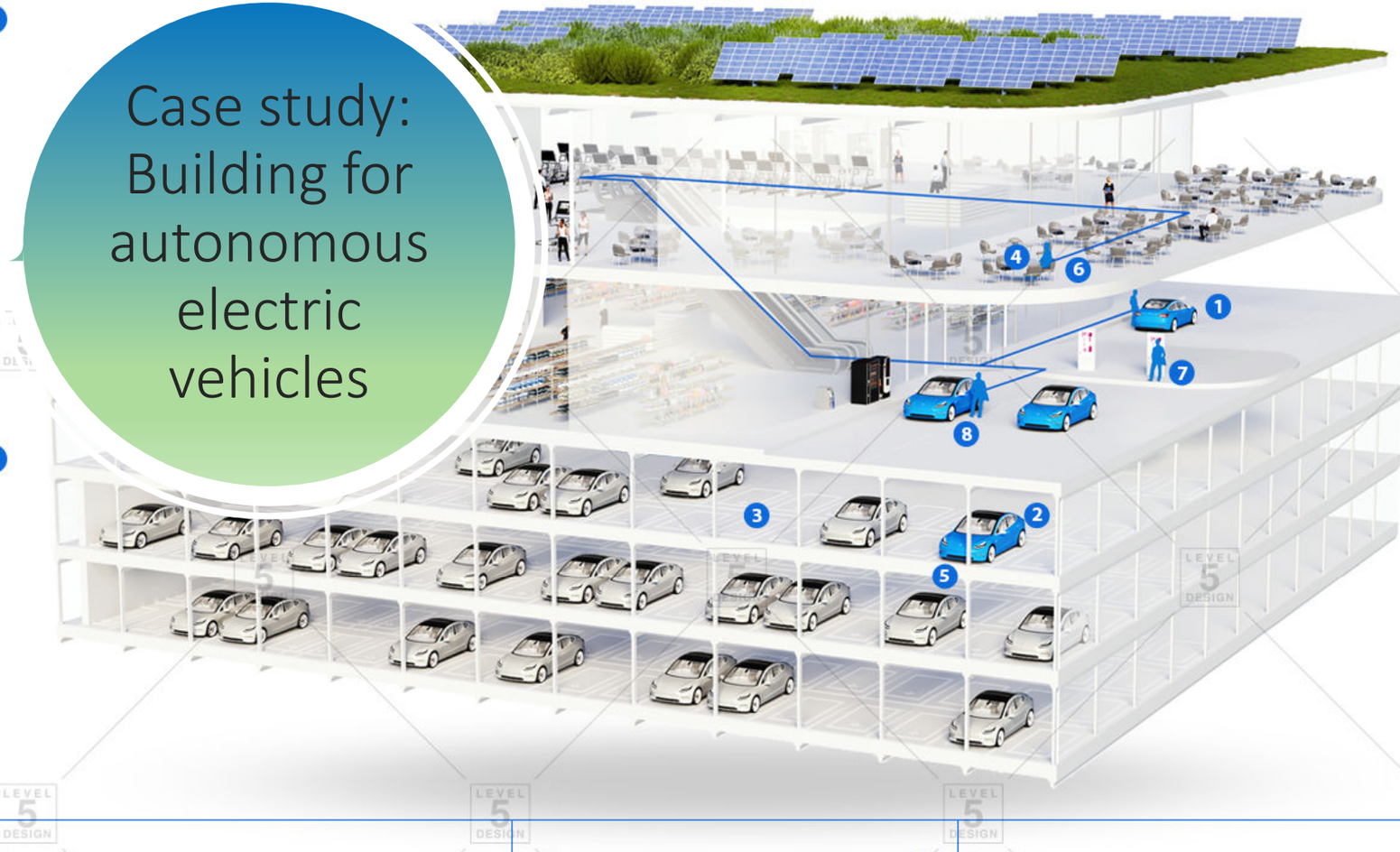
Source separation of C&D materials

- Waste problem
  - Construction and Demolition (C&D) waste 50% of WA waste stream and represents ~45% of materials recovered from recycling
  - Most ends up in landfill
  - It has significant value if managed correctly!
- Lots of opportunities as road construction materials, e.g., non-structural precast concrete products
- Reduce environmental footprint, divert from landfill, improve supply chain integrity, and deliver cost savings
- Improving industry knowledge of recovery, separation and transfer of C&D waste for reuse is important

Recycled products in local roads

Recycled plastic in infrastructure

Case study: Building for autonomous electric vehicles



1 AUTOMATED SET DOWN

Vehicle drops you off right at the entrance – no need to enter a car park again.

2 SELF-PARKING

Vehicle valet parks itself - improving access and convenience.

3 VEHICLE STORAGE

Separate vehicle storage from user experience – up to 60% less space required.

4 GAINING TIME

Self-parking frees up valuable time to do other things

5 ELECTRIC CHARGING

Vehicle is charged inductively while parking so it is ready when needed.

6 ON-DEMAND SERVICE

Keep track of your vehicle at all times and summon it on demand.

7 IMPROVED CUSTOMER EXPERIENCE

Expanded user experience zones provide new revenue generating opportunities.

8 AUTOMATED PICK UP

Be picked up when it suits you right from the front door.

Unsustainable development

Thank you …and Questions

LEVEL 5 DESIGN

Inspiring Innovation in Transport

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