

RESILIENT INFRASTRUCTURE

RESILIENCE DEFINED

WE NEED to be ABLE to DEFINE RESILIENCE

QUANTITATIVE ANALYSIS

EXTREME CLIMATE EVENTS

LESS UPKEEP
EVERY \$1 WE SPEND BUILDING IN RESILIENCE SAVES US \$7-15 IN REBUILDING

BUILD with CLIMATE CHANGE in MIND

CREATE CONSTRUCTION PRODUCTS YOU CAN ASSEMBLE and DISASSEMBLE QUICKLY

SUSTAINABLE DEVELOPMENT GOALS [THESE ARE EVOLVING]

HIGH RISK of EMERGENCY SYSTEMS FAILING

BUILT WITH RESILIENCE

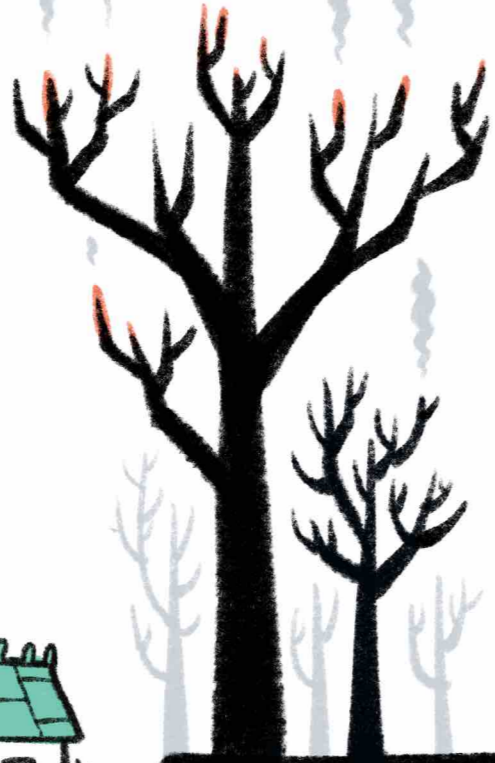
CONSIDER YOUR LEGACY

CONNECTED ORGANISATIONS HAVE RESILIENCE

BUILDING PREFAB OFFSITE

BIO-ENGINEERING

SUSTAINABLE STRUCTURE
LOCAL MATERIALS
ELEPHANT GRASS



MAKE a CONSCIOUS EFFORT to CHANGE

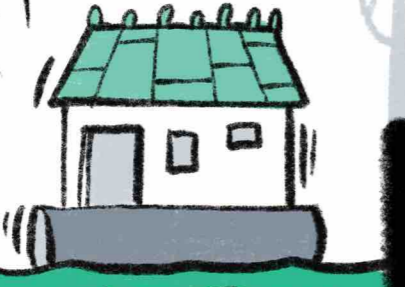
KEEP POLITICIANS ON-SIDE and INFORMED...

TIMING of DESIGN to be CONSIDERED UP FRONT

FUTURE MINDSET
FOCUS ON THIS RATHER THAN IMMEDIATE SATISFACTION

HIGHER... QUALITY and MORE RESILIENT FINAL PRODUCT...
STABILISING this SLOPE for EXAMPLE

RESILIENCE IS THE NEW FORM OF SUSTAINABILITY



MEKONG DELTA for EXAMPLE

IF THE WATER IS RISING...
...LIVE ON IT!...
...that's resilience!!

WATER IS A FINITE RESOURCE AND a KEY FACTOR in RESILIENCE

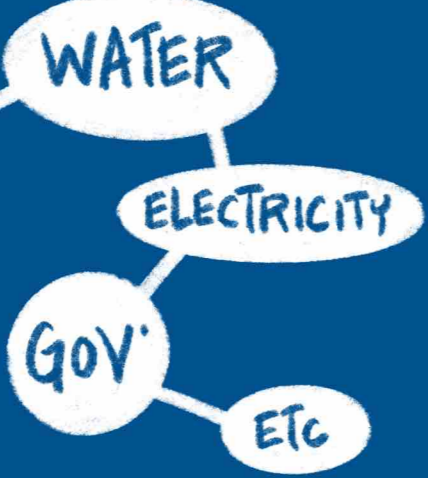
GREEN INFRASTRUCTURE FOR EXTREME HEAT EVENTS



GRASSES

RETRO FIT EXISTING SPACES

COORDINATE HOW WE BUILD COMMUNITIES



ADAPTIVE STREETS...
...USED by MORE THAN CARS...

FOCUS on LIVEABLE ENJOYABLE SPACES

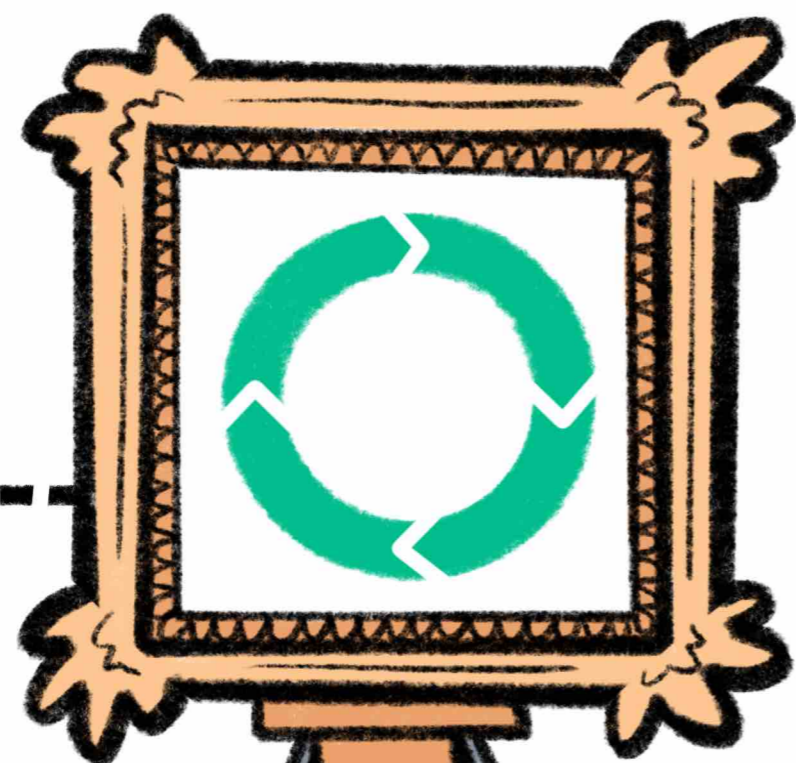
BUILD IN ALTERNATIVE USES for INFRASTRUCTURE

SUSTAINABLE TRANSPORT... PURPOSE OF TRANSPORT...



CIRCULAR ECONOMY

BUILD IN a BETTER LIFE CYCLE in NEW INFRASTRUCTURE



LESS MATERIAL

LESS WASTE

NOT THE ANSWER...
...BUT AN ANSWER

PREFAB is a SYSTEMISED METHOD OF CONSTRUCTION... HOW CAN WE GET INDUSTRY to EMBRACE MODULAR CONSTRUCTION?

DESIGN WASTE OUT AT the BEGINNING...

RETHINK DESIGNS

ABOLISH the IDEA of DEMOLITION!
INSTEAD FOCUS on REUSE



AIM FOR GOOD ENOUGH

TO DO THE JOB...
...NOT PERFECTION!

REGENERATIVE SYSTEMS
REUSING COMPONENTS

DESIGN

AROUND the WASTE GENERATED

SATISFACTION NOW and in the FUTURE...

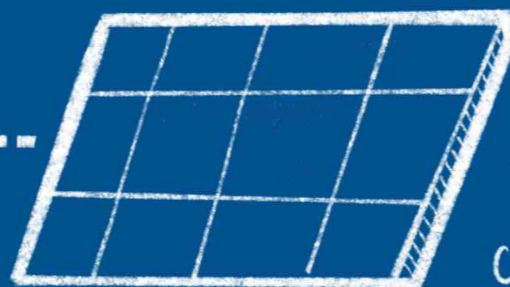
BUILDING MATERIALS ARE LIMITED SUPPLIES!

REUSE and REDEVELOP OLD SITES RATHER THAN BUILD NEW!

CAN WE USE WHAT WE HAVE?

CARBON EMBODIED ENERGIES in SOLAR TECH...

the VALUE CHAIN!



RECYCLING PV CELLS...
DOWN to COMMERCIALISATION!



ENGINEERS AUSTRALIA



THE UNIVERSITY OF MELBOURNE

TAKING ACTION *with* COLLABORATION

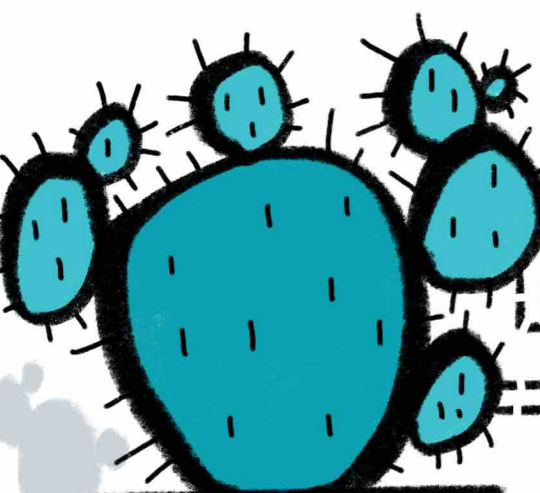
BRINGING STAKEHOLDERS **TOGETHER** to UNDERSTAND KEY OBJECTIVES

WE HAVE POLICIES but WE DON'T ALWAYS ENFORCE THEM!

THINK OUTSIDE the BOX

WHAT WILL BE YOUR **LEGACY** for FUTURE GENERATIONS?

OVERCOMING BARRIERS *with* COLLABORATION



ORGANISATIONAL INFRASTRUCTURE... NOT THE BUSINESS CASE!

- POLITICS
- ECONOMY
- LEGAL

WE NEED these STRUCTURES NOT to ACT AS **BARRIERS!**

IT'S ABOUT **WHAT** to do **WHEN**

INDUSTRY COMING TOGETHER to **INFLUENCE** GOVERNMENT LEGISLATION



TO DELIVER TO **RESILIENCE**



WE MUST ALL PROMOTE SUSTAINABILITY COLLECTIVELY AS ENGINEERS

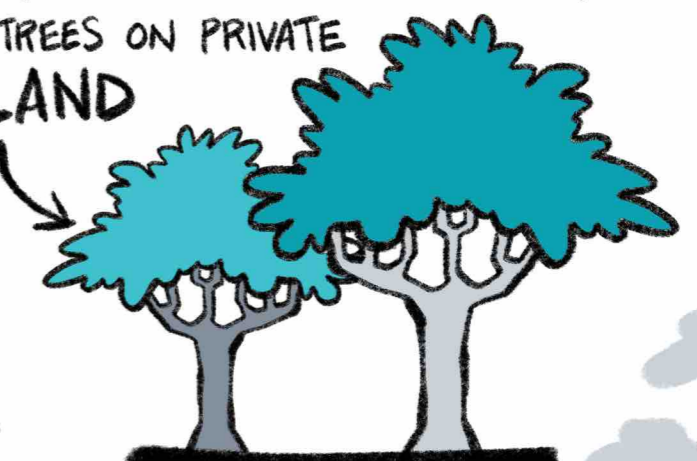
SHARING VIEWS IS IMPORTANT

CONSIDER the TIMING of DECISIONS in CHANGE

EARLY NOT LATE STAGE...

HOW DO WE DO **BIG** and SUSTAINABLE?

ROLE of LOCAL GOVERNMENT - KEEPING TREES ON PRIVATE LAND



GET POLITICIANS

ON SIDE

CROSS COLLABORATION

BRING THEM ALONG

SELL the BENEFITS to **HUMANITY**

SUSTAINABILITY and RESILIENCE as **BAU**... 'EDUCATION' IS HOW WE WILL ACHIEVE THIS!



DIGITAL DATA *for* FUTURE

INFRASTRUCTURE

ACCESSIBLE
and
SHAREABLE

SECTORS NEED to
SHARE

DATA IS
SCATTERED

SHARING
and
UNDERSTANDING
WHAT IS THERE

HAZARD
DATA

CENTRALISED
DATA HUB

SHARE
DATA...

THERE IS A
LOT OF DATA IN
DIFFERENT
PLACES... THIS CAN BE
DIFFICULT to ACCESS...

FOR
SCENARIO
CREATION

USING DATA to
PREDICT

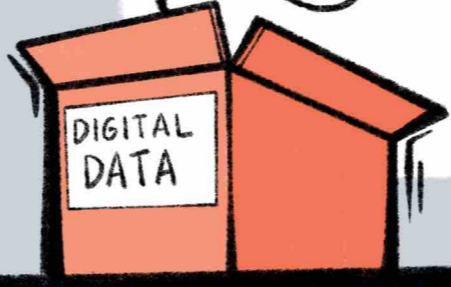
REPLICATING the ENVIRONMENT



A LOT HAS
CHANGED OVER
THE LAST 30 YEARS...

WE ARE HEADED
IN THE RIGHT
DIRECTION

DATA is NOT CONSISTENT



DATA
HERE...

OH... AND
HERE...



RETROFIT EXISTING
SPACES WITH TECH...

WORK IS NEEDED to
IDENTIFY COMMON
SCENARIOS

QR CODES on
FITTINGS to
EXTEND LIFE CYCLE

CE THINKING
ENABLED BY TECHNOLOGIES

DIGITAL TWINS
ENABLING US TO MODEL the
FUTURE



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