

<b>DOCKETED</b>	
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<b>Organization:</b>	Bill Leighty
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*Comment Received From: Bill Leighty*  
*Submitted On: 3/14/2023*  
*Docket Number: 23-IEPR-01*

**Energy consequences CA sprawl to CarFree Cities, to accommodate millions fleeing rapid sea level rise, within a few decades**

Transforming CA sprawl to CarFree Cities, to accommodate millions fleeing rapid sea level rise, within a few decades, will have profound beneficial consequences for Energy and for all aspects of public and private life.

See: <https://vimeo.com/373679728> Designing “CarFree” Cities to Welcome Millions Fleeing Rapid Sea Level Rise, Within a Few Decades

See also an imminent enabling technology: <http://www.leightyfoundation.org/wp-content/uploads/Bill.Leighty.4Aug-Dilemma-13Jul21.pdf>

Thank you.

*Additional submitted attachment is included below.*



An aerial photograph of a city skyline, likely New York City, viewed from a high angle. The city is densely packed with skyscrapers, and the surrounding water is visible. The sky is a mix of blue and orange, suggesting a sunset or sunrise. The text is overlaid on the top and bottom left of the image.

How to apply COVID – driven economic recovery ?  
In CA, via EPIC ?

**“Climate Change”**

- Warming
- Severe weather
- Sea level rise
- Ocean acidification
- Species extinction
- Human conflict

**Responses:**

- Mitigation: cut GHG
- Adaptation
- Geoengineering



## San Diego

Scenario 2100

Unchecked pollution

Very difficult to predict

Source:

Climate Central

29 Oct 19

Source: <https://choices.climatecentral.org/#7/15.882/100.981?compare=scenarios&carbon-end-yr=2100&scenario-a=unchecked&scenario-b=extreme-cuts>



## San Diego

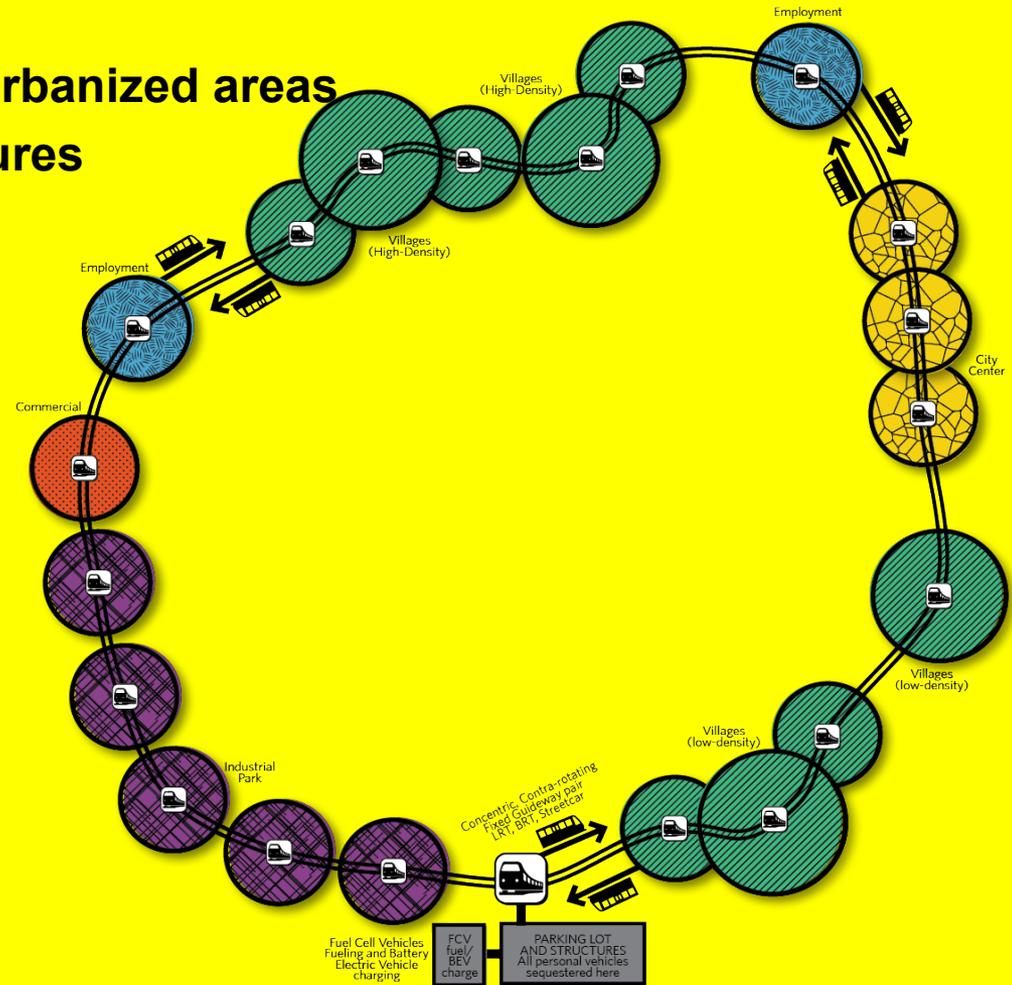
Extreme carbon cuts  
Scenario 2100  
Very difficult to predict

Source:  
Climate Central  
29 Oct 19

Source: <https://choices.climatecentral.org/#7/15.882/100.981?compare=scenarios&carbon-end-yr=2100&scenario-a=unchecked&scenario-b=extreme-cuts>

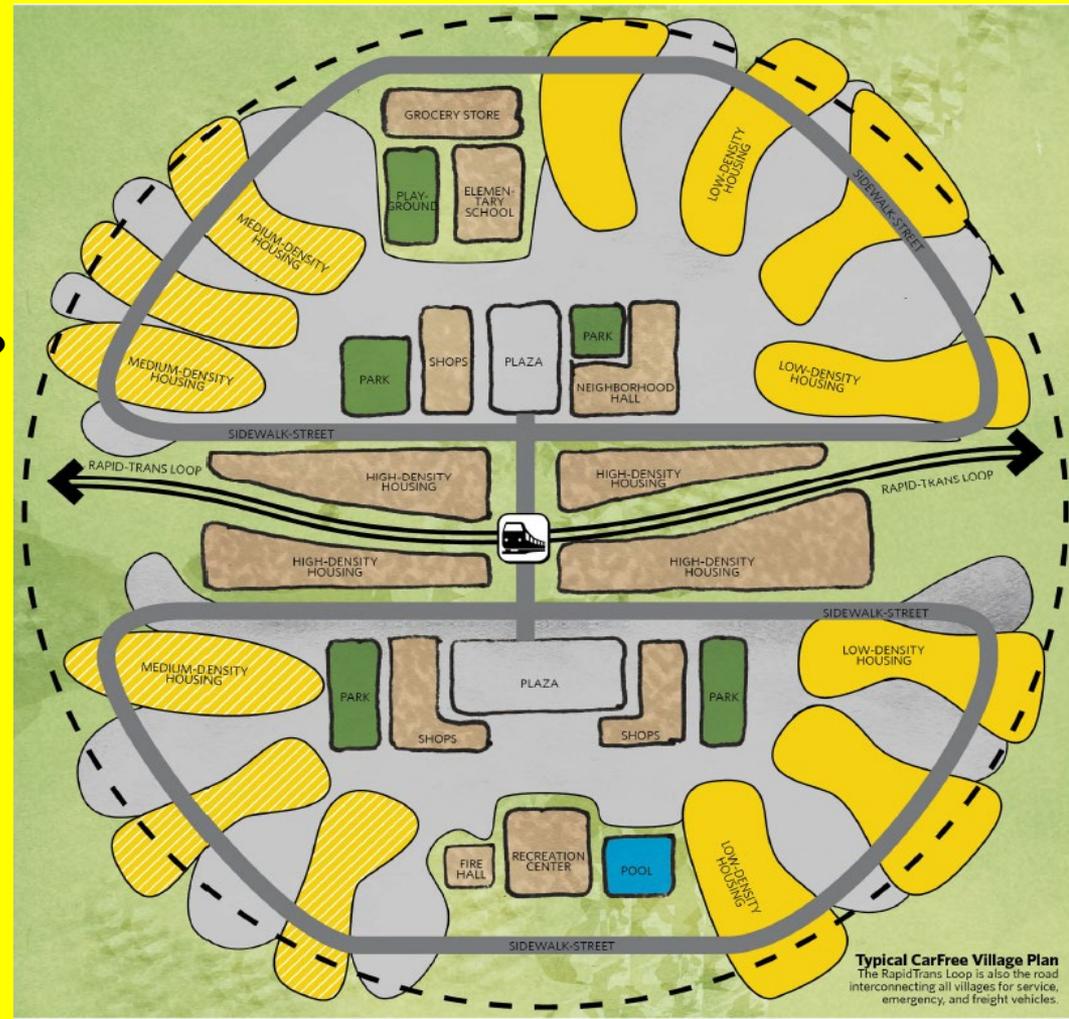
# WHAT IS “CARFREE, USA” ?

- Complete necklace of “Villages” dropped on low-density US cities
  - Complete “city within, upon, a city”
  - Diverse
  - Most services
- No:
  - Personal vehicles in urbanized areas
  - Parking lots or structures
  - Driveways, garages
- 100,000 + people
- Density high, stress low
- Low COL (cost of living)
- New urban lifestyle
- New urban topology
- Prevent sprawl
- Personal vehicles stored



# WHAT IS “CARFREE, USA” ?

- **Efficiency:**
  - Land, habitat
  - Energy
  - Materials
  - Time: everyone
- **Replicate:**
  - Many US cities
  - Intersect, as needed
  - Prevail in USA ? Beyond ?
  - Replace “car culture”



## “Village” node

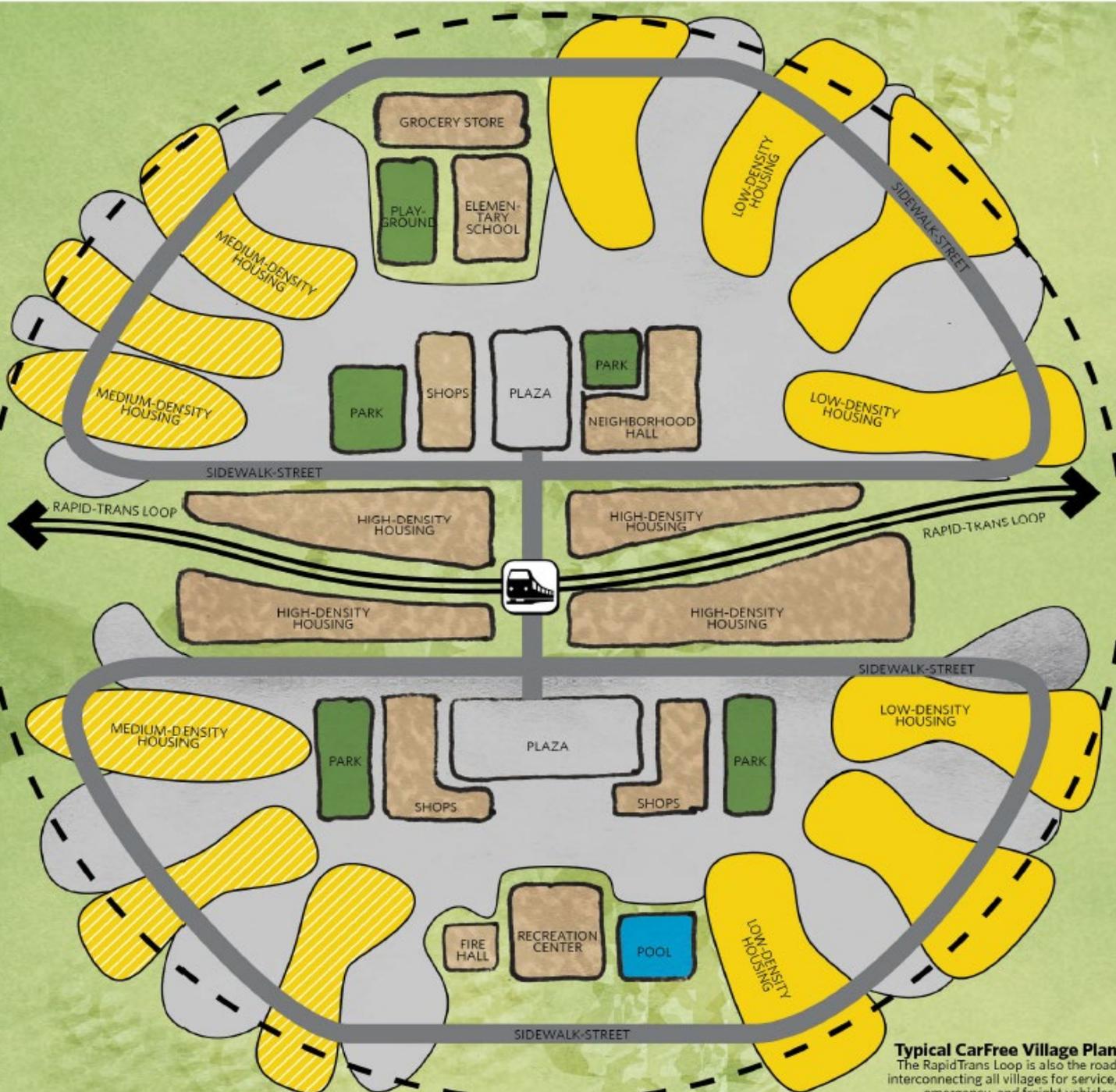
- Typical; unique
- Transit station centric
- Build “Community”
- Dominant use varies
- Influence envelope
- Pavement
- No private LDV’s
- No “parking”
- No driveways
- No garages
- TAAS
- TNC’s
- More “Access”
- Less “Mobility”
- Pearls on necklace

### TAAS:

Transportation  
As A Service

### TNC:

Transportation  
Network  
Company  
(Uber, Lyft)



**Typical CarFree Village Plan**  
The RapidTrans Loop is also the road interconnecting all villages for service, emergency, and freight vehicles.

# WHAT IS “CARFREE” ?

- Response to national, global emergency: rapid sea level rise
- New urbanity “imposed” upon extant cities
  - Low-density regions
  - Overlay
  - Helicopter down
- “Taking” of private property
- High-density
- No private personal vehicles in urbanized areas
- Topology: loop, donut, torus
- Station-centric “village” nodes
- “Access” via contra-rotating fixed-guideway transit, stations @ 500 m
- Light rail, streetcar, hybrid:
  - Electric drive
  - On-board Hydrogen or battery energy
- Passengers, packages, mail, freight – UPS, FEDEX, other
- Paving:
  - Walk, bike
  - Service vehicles
  - Emergency vehicles

# WHAT IS “CARFREE” ?

- Rapid Response to national, global emergency: rapid sea level rise
- Conceptual template
- Planned community: many examples
- “Access” replaces “Mobility”
- Peripheral parking for personal vehicles

## **Complete necklace of “Villages” dropped on low-density US cities**

- **Complete “city within, upon, a city”**
- **Diverse**
- **Most services: max “access”**

# BENEFITS, COSTS

## Benefits:

- Walk, bike more: healthier, reduce all health care costs
- Lower COL (cost of living): Lower --
  - Private vehicle ownership
  - Private after-tax expense
  - Lower public capex, opex
- Reduce greenhouse gas (GHG) emissions:
  - Transportation
  - New buildings
  - Lower embodied energy
- Avoid sprawl
- Envelope influence effect: car-independence propagates outward
- Enhance human contact; community → **Happiness**

## Investments:

- Taking private property: eminent domain
- Transport system: fixed guideway loops, rolling stock, stations
- Other infrastructure: utilities, village paving

## Attractive Reward-to-Risk ratio:

Only way to attract the large capital needed

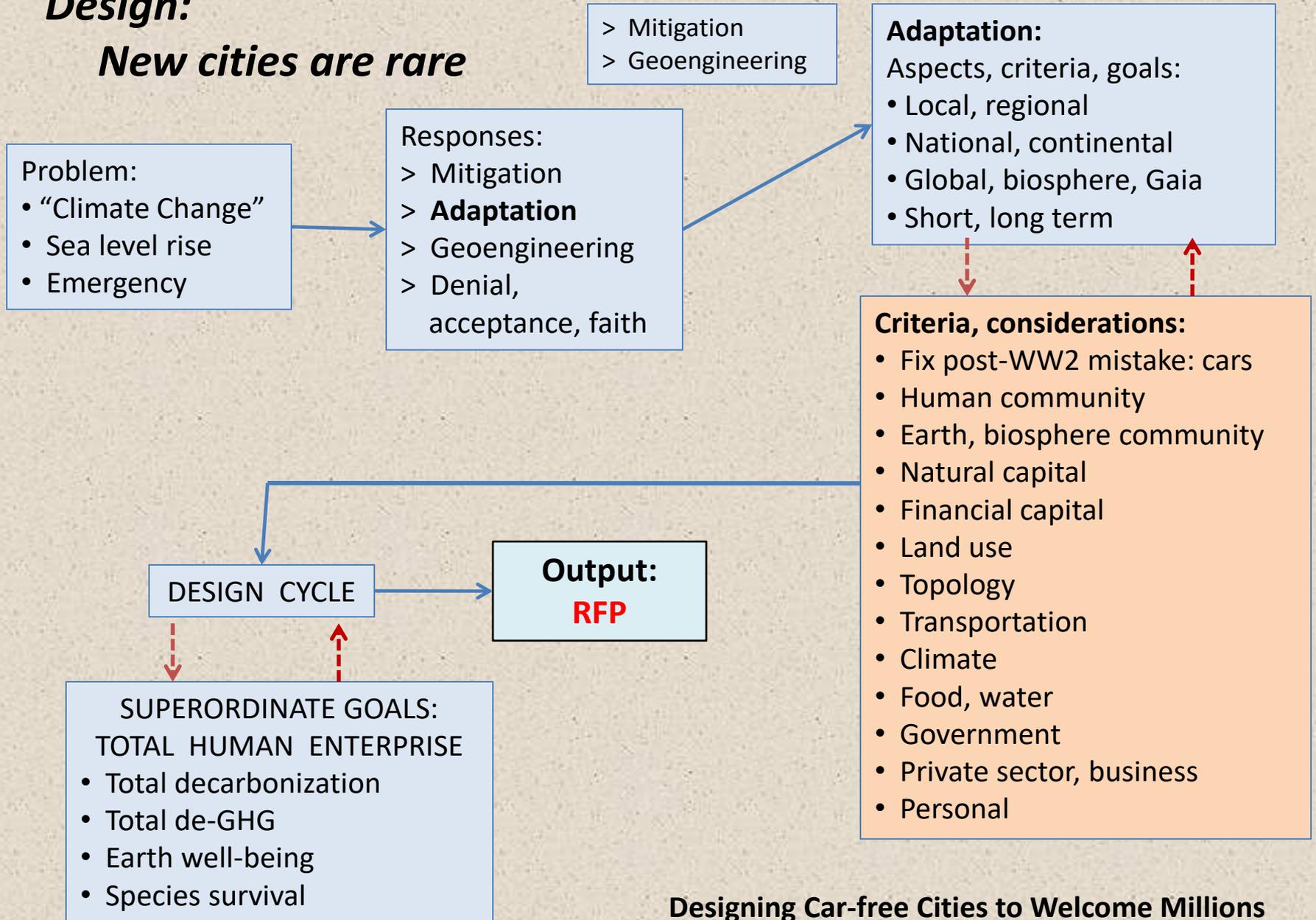
# DESIGNING CARFREE, USA

Very complex: start NOW

- Recruit, select host cities: reception, permitting
- Verify market: finance ?
- Topology: Transportation system loop
- Loop diameter, village diameter
- Right-of way, footprint, influence envelope
- Population target
- Schedule: urgent
- Compose RFP; RFQ. Design-Build ? Operate ?
- Finance: costs, cash flow, reward : risk
- Success motivates:
  - Car-independent living propagates beyond loop
  - Greater devotion to mitigation

# Design:

## *New cities are rare*



**Designing Car-free Cities to Welcome Millions  
Fleeing Rapid Sea Level Rise**

# ***World Energy Outlook 2019***

**International Energy Agency (IEA)**

**[www.iea.org / weo](http://www.iea.org/weo)**

- **Dr. Fatih Birol, IEA Executive Director:**
  - “ ... crystal clarity ... there is no single or simple solution to transforming global energy systems.”
  - “Without new policies in place, the world will miss its climate goals by a very large margin.”
- **Tomorrow’s energy supply drivers:**
  - Shale revolution
  - LNG (liquefied natural gas)
  - Falling costs of renewables
  - Digital technologies
- **What is the world pathway to meet global climate targets and other sustainable energy goals?**
- **Africa: affect global trends ?**
  - What energy choices
  - Rise of consumers
- **Offshore wind: How large ?**
- **Could world's gas grids deliver low-carbon energy?**

# ***Transform World's Largest Industry***

## **Complete energy systems:**

- Renewable energy (RE)
- CO<sub>2</sub>-emission-free (CEF)
- Multiple sources
- Variable generation (VG): Time-varying output
- Integrated, synergistic
- Electrochemical or Carnot ?
- Move, store, as electricity or as water-split Hydrogen ?
  - Electrochemical: “ electrolyzer ” proven
  - Photochemical: catalyst
  - Biochemical: photosynthesis
  - Thermochemical: High-T solar, nuclear
- Lower Dispensed Cost: Wind-source Hydrogen Fuel

**Entirely via electricity systems ?**

# **MITIGATION: USA, GLOBAL, LOCAL**

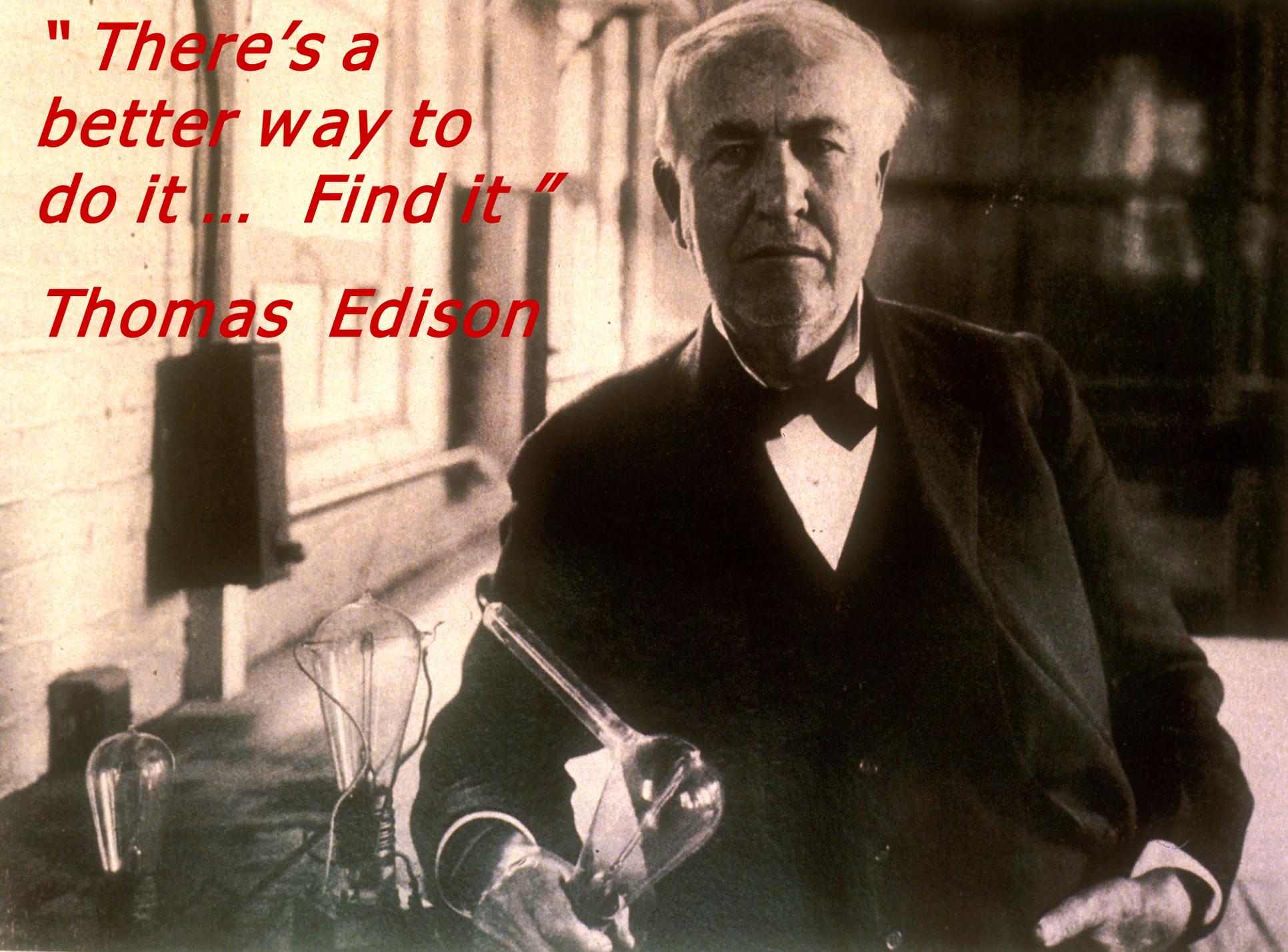
**Don't give up**

- Quickly reduce, then zero, ALL anthropogenic greenhouse gas (GHG) emissions
- Transform the world's largest industry from ~ 85% fossil to ~ 100% renewable, CO<sub>2</sub>-emission-free energy sources, as quickly as we prudently and profitably can
- Run the world on renewables
- Resist “adaptation” and “geoengineering”

1. **Complete, integrated, optimized, CO<sub>2</sub>-emission-free energy systems based on C-free fuels – Hydrogen (H<sub>2</sub>) and Anhydrous Ammonia (NH<sub>3</sub>) – via pipelines**
2. **Deep (6 - 10 km), hot dry rock (HDR) geothermal via Electro Pulse Boring (EPB), to go deep enough, cheap enough, almost anywhere on Earth**

*" There's a  
better way to  
do it ... Find it "*

*Thomas Edison*



# Far more Ambitious:

- Unacceptable scenarios: better, faster
- Renewables industry
- Beyond electricity systems
- Transportation + CHP fuels
- Hydrogen + ammonia fuels
- Run the World on Renewables
- ~ 100 % GHG-emission-free energy
- ~ 100 % GHG-emission-free enterprise



# *Transform World's Largest Industry*

## Hypothesis:

- Limit elec to “first & last km, m” of energy system
- C-free fuels between: pipelines, low-cost storage

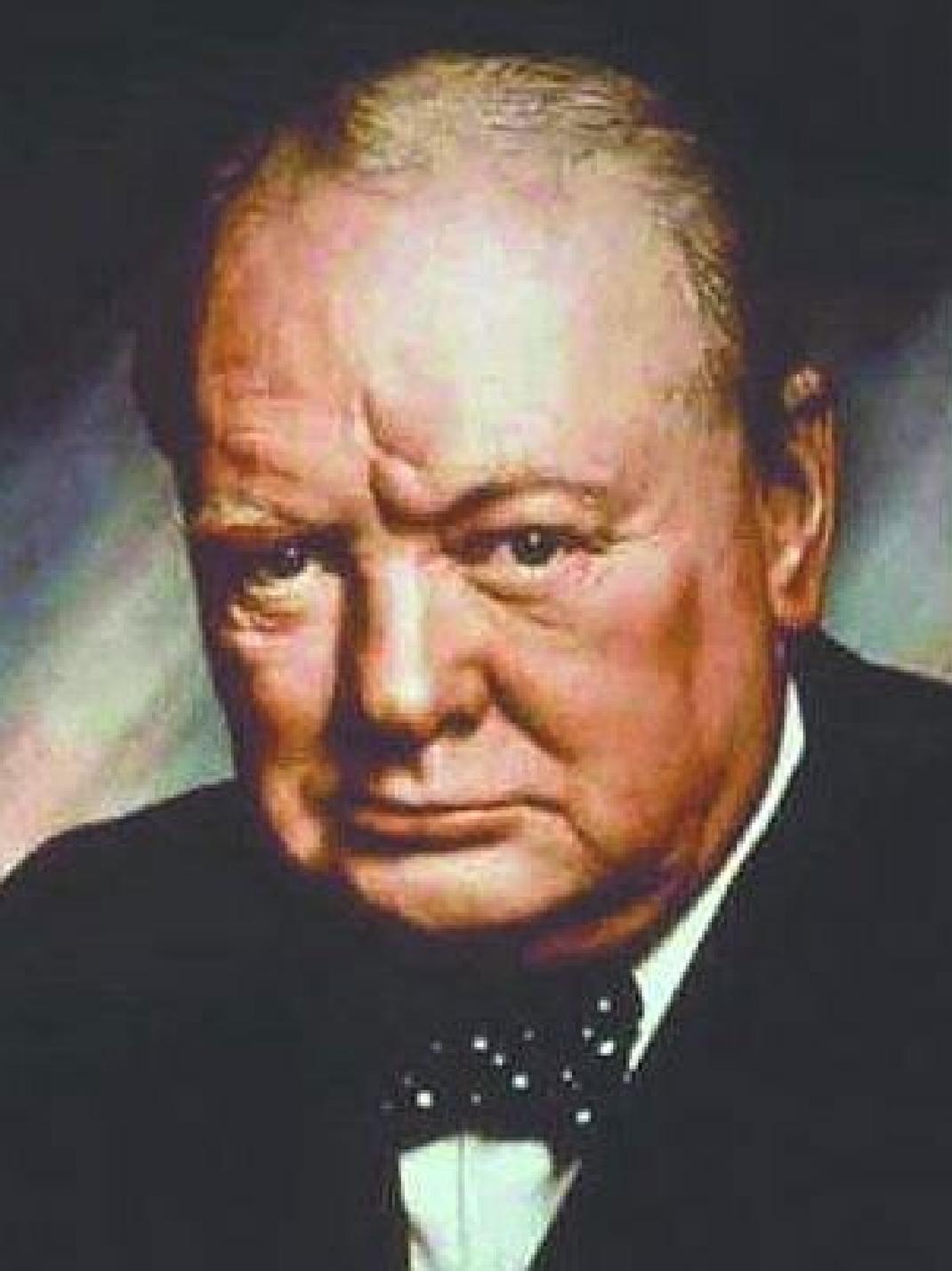
## How to know ? Who will model, study, propose ?

- Urgent !
- Prevent opportunity costs: wasted capital → Grid invest
- Collaborative + funding
- Optimum mix, strategy

# IPCC Special Report 15

7 October 2018

- **1.5° C limit, or else ... tipping ?**
- ***likely* reach 1.5°C between 2030 and 2052 at current rate**
- **~ 2050 achieve net-zero global anthropogenic CO<sub>2</sub>**
- **DNV-GL “Energy Transition Outlook 2019”**
  - **Technology ready; policy not**
  - **Not fast enough**



**“ Americans can be  
counted on to  
always do the right  
thing –**

**but only after they  
have tried  
everything else ”**

**Winston Churchill**

The dog caught the car.

Dan Reicher