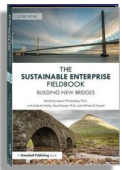


Economic and financial; and Technology

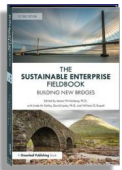
Sustainable globalization

Linda Morris Kelley

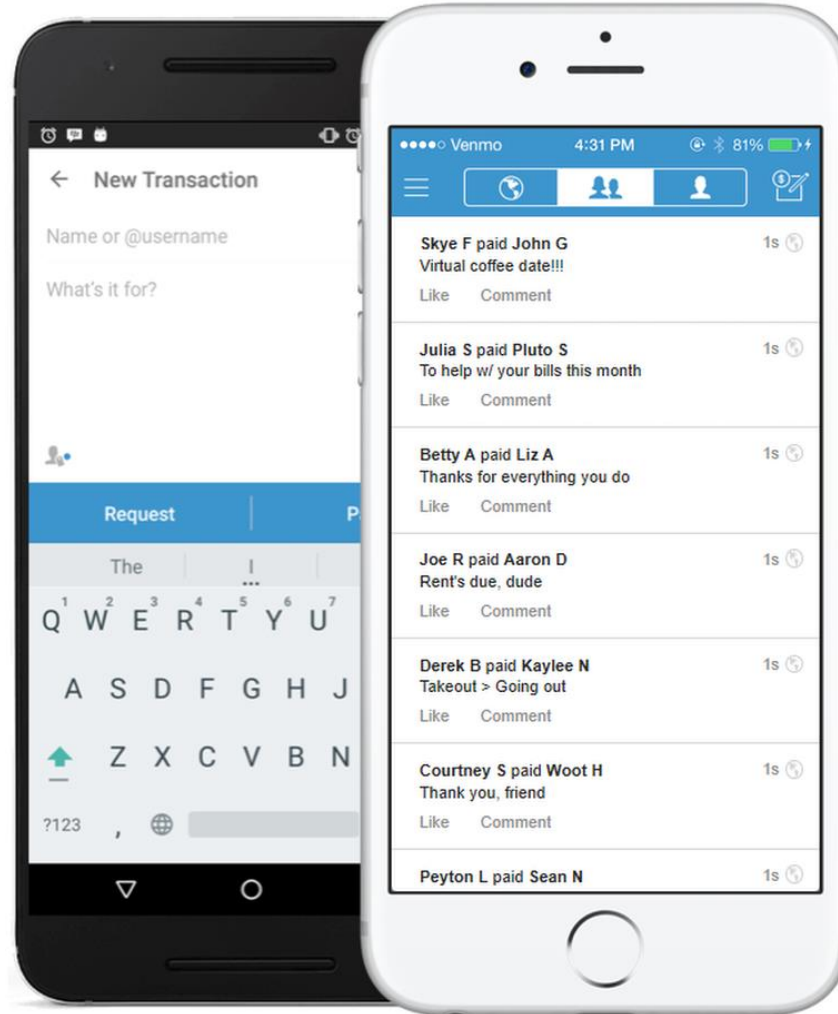
April 23, 2020



Who's in the Zoom Room today?

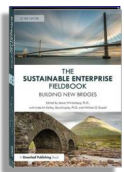


Venmo



Send money and
make purchases at
approved merchants

[Sign Up Now](#)



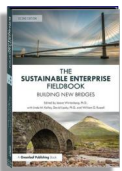
Mental models = operating systems

Software for hardware, Computer / mobile phone +

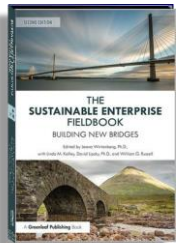
- Microsoft Windows
- Apple iOS
- Google Android
- Linux

Learnware for wetware, Human

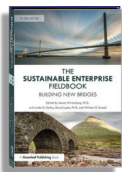
- Person/individual mental models
- Group traditions, approvals,
- Societal laws, regulations, policies; culture



What cases in the Chapter reading interested you most?



Economic and financial lens



Eco – from the Greek, *oikos* = house, dwelling place, habitation; from PIE root = *weik* “clan”

Economy

People making their living,
originally household management

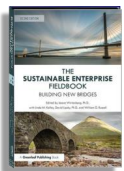
Ecology

Relationship of living things to
their environment

<https://www.etymonline.com/>

How do people “make a living?” How do societies thrive?

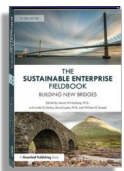
- Options?
- Consequences?



Economic systems, variations on a theme



How societies and their governments apportion and distribute resources, goods and services



Buried beads and shipwrecks

Shell beads with holes

41 beads in Blombos Cave, South Africa.
Dated 75,000 b.c.e., brought from dozens
of miles away



12 beads with red ochre in a cave in
Morocco. Dated 80,000+ b.c.e.

Beads in the Mousterian level, Qafzeh Cave, Israel. 90,000 b.c.e

<https://www.theguardian.com/world/2004/apr/16/artsandhumanities.arts>

https://www.researchgate.net/publication/8074365_Nassarius_kraussianus_shell_beads_from_Blombos_Cave_Evidence_for_symbolic_behaviour_in_the_Middle_Stone_Age

3600 year old shipwreck in the Mediterranean



The boat was loaded with copper ingots

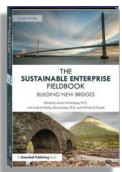
<https://www.ancient-origins.net/news-history-archaeology/oldest-shipwreck-0011739>

Otzi, the iceman



<http://italianthro.blogspot.com/2011/03/otzi-the-iceman-reconstruction.html>

- Found in the Alps in the Otztal Mountains, an area that is now Italian near the now Austrian border
- Lived about 5300 years ago
- Died at about age 45
- He had a copper and yew axe with him. The copper came from southern Tuscany, hundreds of miles from where this man died.



Coffee, tea, tomatoes, and bananas

- Coffee



Ethiopia

- Tea



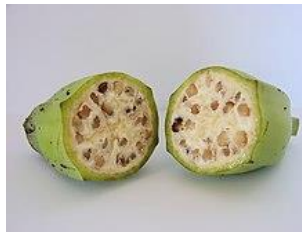
China

- Tomato



South America

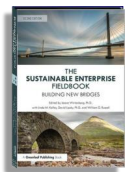
- Banana



Southeast Asia



In the U.S., our everyday foods come from all over the globe.



Sustainable Supplier Transportation Networks

I - Manufacturers

M - Plants

J - Retailers

T - Modes of transportation / transactions

K - Demand markets

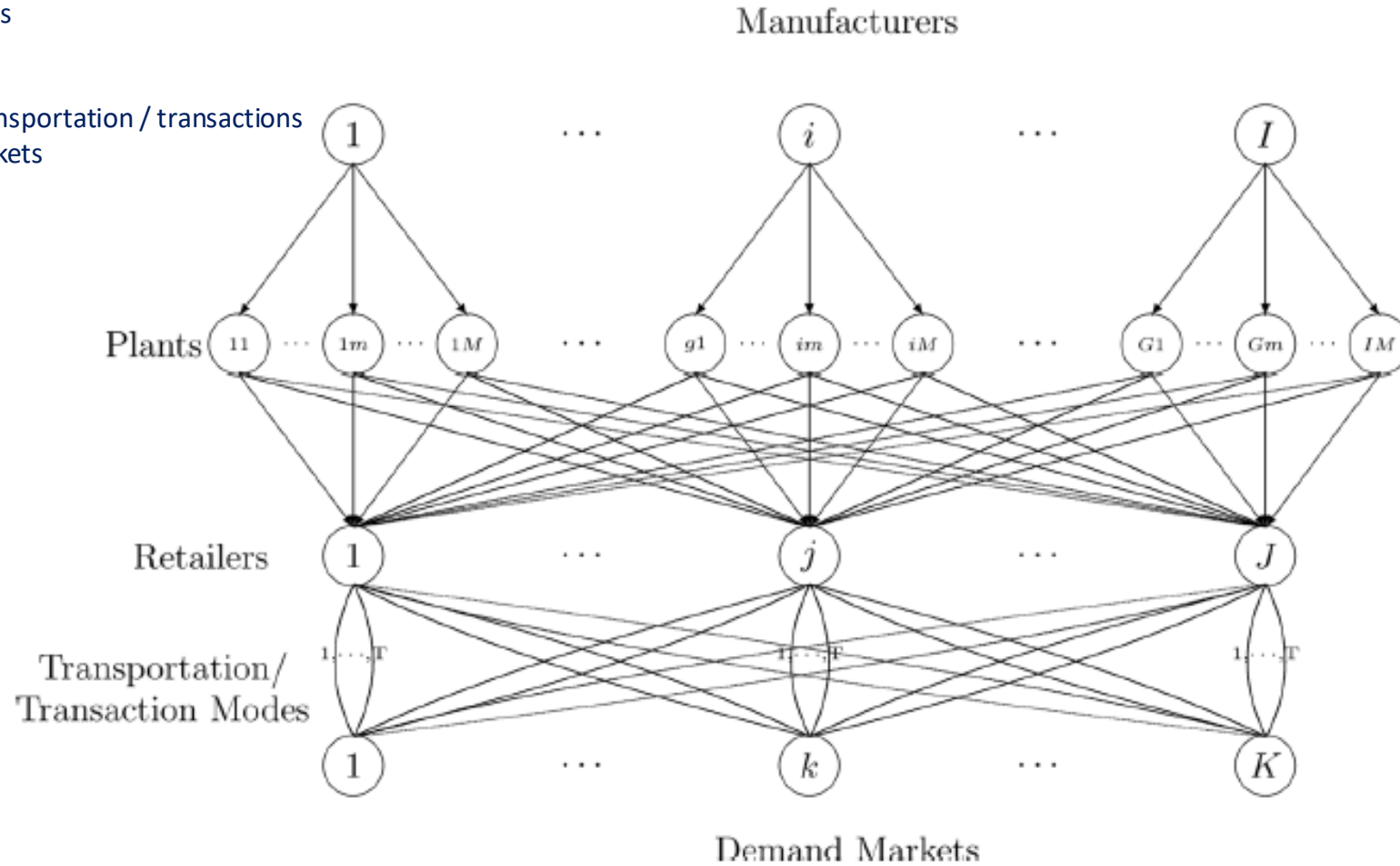
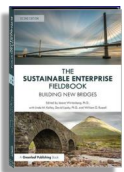


Figure 1. The supply chain network with manufacturing plants.



Supply Chain Performance Metrics

Efficiency

- A measure of how well we utilized the available resources to accomplish the goals of the firm.

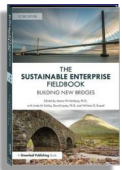
EVOLUTION OF MEASURING EFFICIENCY

Stage 1: Financial

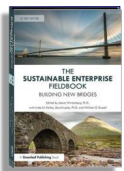
Stage 2: Productivity

Stage 3: Performance

Stage 4: Integration of
Performance and
Financial

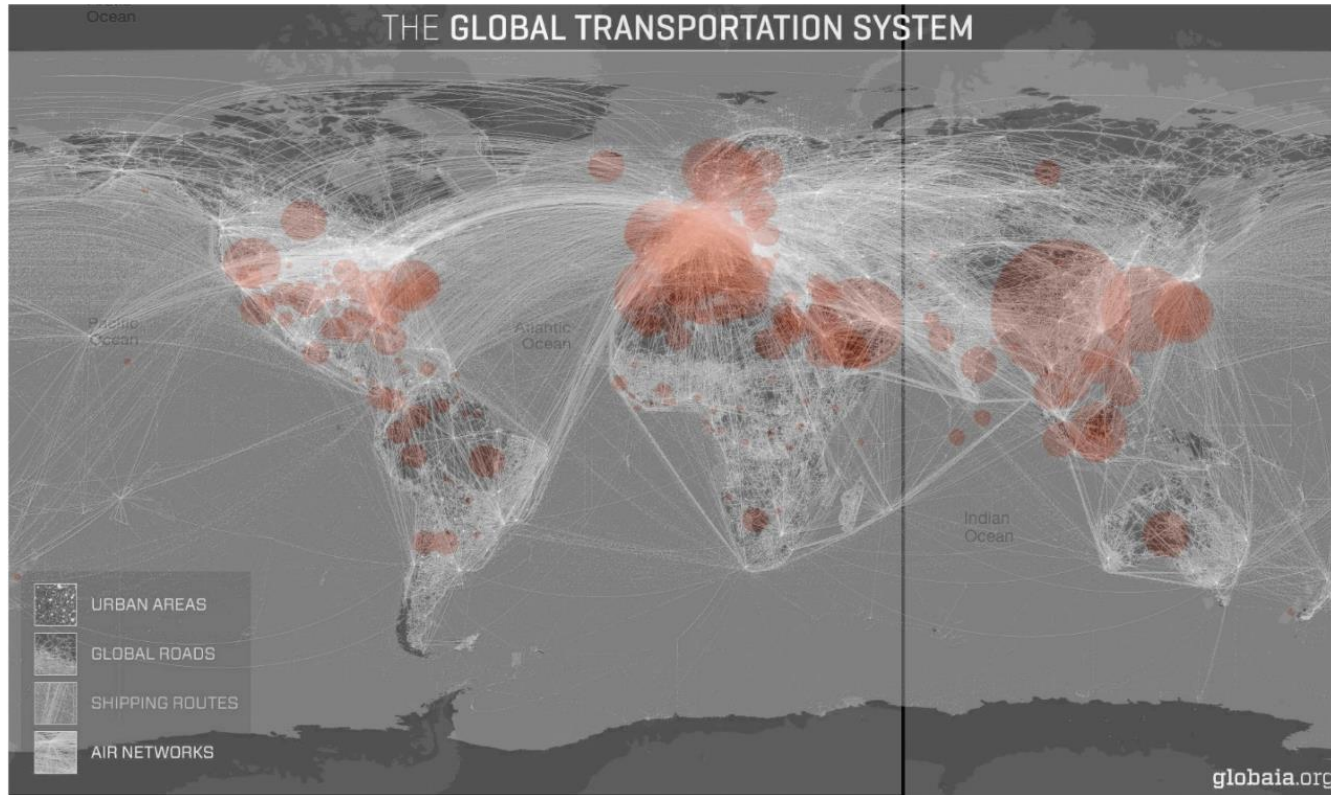


What global supply chain and transportation networks actually look like



Assessment of real risks from a holistic nested and networked systems perspective?

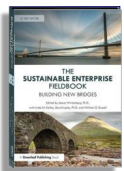
Global transportation + COVID-19 infections



Bananas, America's favorite fruit
Developed cultivars to produce soft seeds, firm, sweet flesh and thick, protective skins that are easy to peel

Monoculture growing accentuates strengths and weaknesses, and susceptibility to disease

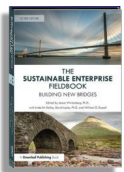
Spread of disease infestation, pandemics, through global transportation routes



Where's the toilet paper?



A specialization and supply chain issue



Antibody Test, Seen as Key to Reopening Country, Does Not Yet Deliver

“The Food and Drug Administration has allowed about 90 companies, **many based in China**, to sell tests that have not gotten government vetting, saying the pandemic warrants an urgent response. But the agency has since warned that some of those businesses are making false claims about their products; health officials, like their counterparts overseas, have found others deeply flawed.”

Steve Eder, Megan Twohey and Apoorva Mandavilli

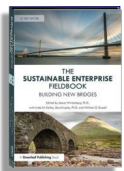
<https://www.nytimes.com/2020/04/19/us/coronavirus-antibody-tests.html?action=click&module=Spotlight&pgtype=Homepage>

The majority of the chemicals and reagents used in these tests are made in China.

Part of the problem is clearly foresight, a failure of imagination. But the other part of the problem is what we didn't **do** in advance, and what we're failing to do now. And that is a failure of action, and specifically our widespread inability to **build**.

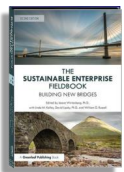
Marc Andreessen

<https://a16z.com/2020/04/18/its-time-to-build/?fbclid=IwAR2V-2GrTjq8wnzZgYbym3yRHq2dHeikH9l69a5gbvfl4oXHk53mRPtikE>



Finance = mutual promises (offers with conditions + acceptance of offers and fulfillment promises)

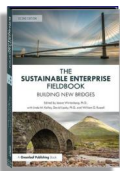
- Accounting
 - Credits
 - Debits
 - Reserves
 - ROI
 - Capital and profits
- Standards of exchange
- Risk management
- Assignment of capital



If we are to revise our current economic model, where do we start?

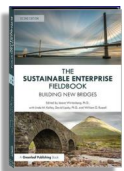
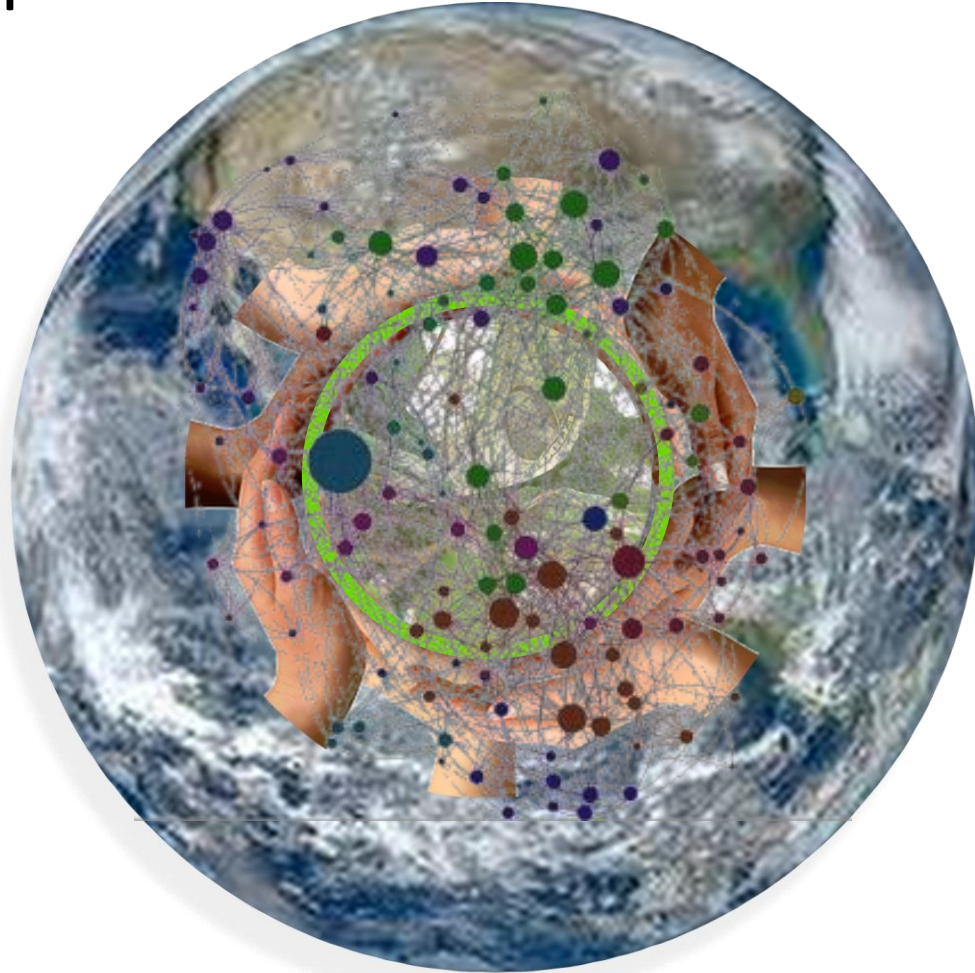
The problem with most of today's variants of capitalism is that they produce unintended consequences on a planetary scale. They ignore key externalities (particularly things like species loss and climate change), assuming that growth can continue almost indefinitely.

Jeremy Grantham and John Elkington
"Your grandchildren have no value"



Economy is a *complex adaptive social system*, created by people and maintained by people

Maintained via a shared
mental model embedded
in the daily operating
system of millions and
millions of people,
networked together



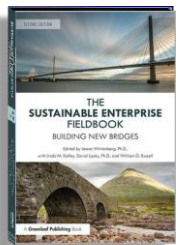
Capitalism, the world's dominant economic system has a triple crisis

- Pandemic induced healthcare crisis, that has created an
- Economic crisis, tumbling into an ongoing
- Climate crisis

What next?
Where to look?



Mariana Mazzucato

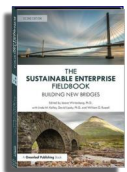


https://www.socialeurope.eu/capitalisms-triple-crisis?fbclid=IwAR26O26vqXsi_WaFwyH0lcateN3dGfCMZS5RSxhTEExO4AphRzsFFQ2RTuw

ESG (environmental, social, governance) framework and the migration of values

The SARS-CoV2 (COVID-19) global pandemic has raised visibility and challenged our sense of the real value regarding certain areas

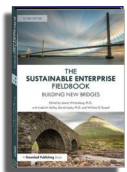
- Essential products and services
- Universal healthcare?
- Universal income?
- Clear skies?
- Clean waters?
- Education?
- Family time?
- Value > compensation, particularly for “essential work”
- Privilege: Inclusion and exclusion-- traditions, policies, and “rights.”
 - Whose?
 - Where?



A Green New Deal (House Resolution 109)

116th Congress, 2019-2020

- Starting with the findings of the UN Special Report on Global Warming (October, 2018) and the IPCC Report of November, 2019,
- Prophetically states, “Whereas the United States is currently experiencing several related crises,” ...
- A 10-year mobilization
 - Climate change
 - Pollution
 - Inequities
 - Healthy food and clean water
 - Resources depletion
 - Healthcare
 - Education and training

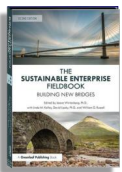


Rethinking the value of work vs the pay for work, from a systems perspective

- Making a living, and more
 - Who works?
 - Who gets paid for work (earned income)?
 - Who gets unearned income?
- Extraction vs circulation; consequences, intended and unintended
- Contributing to the well-being or fragility of society?
- Reconstituting the measurement and compensation for the value of work done
- The purpose-driven company (re: DSM, Interface, and Eileen Fisher)
- ▶ GDP = a seriously inadequate measure of economic health

“Nobody can be successful –or even dare to call themselves successful –in a world that fails.”

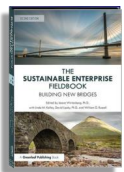
Feika Sijbesma, CEO, DSM



5 Minute Break

“Money” as a mediator of exchange of value over time and distance

- Shells, stones
- Livestock, goods
- Critical or rare earth minerals
 - Salt
 - Copper
 - Gold
 - Silver



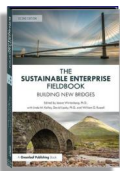
US Dollar

THIS NOTE IS LEGAL
TENDER FOR ALL
DEBTS, PUBLIC AND
PRIVATE



Promissory note, issued and buffered by the Federal Reserve backed by the faith and credit of the United States

- Re-presentation of promised value of goods and services in transferable form
- Promise that extends over time and distance
- Bills of credit, Fiat; I.O.U.

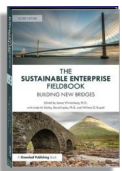


Digital promises, or “money”

- Bank transfers
- PayPal, Venmo, Square
- Blockchain
- Ethereum
- Other...

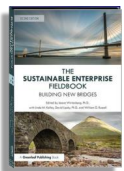


Digital promises of exchange in the form of traceable contracts

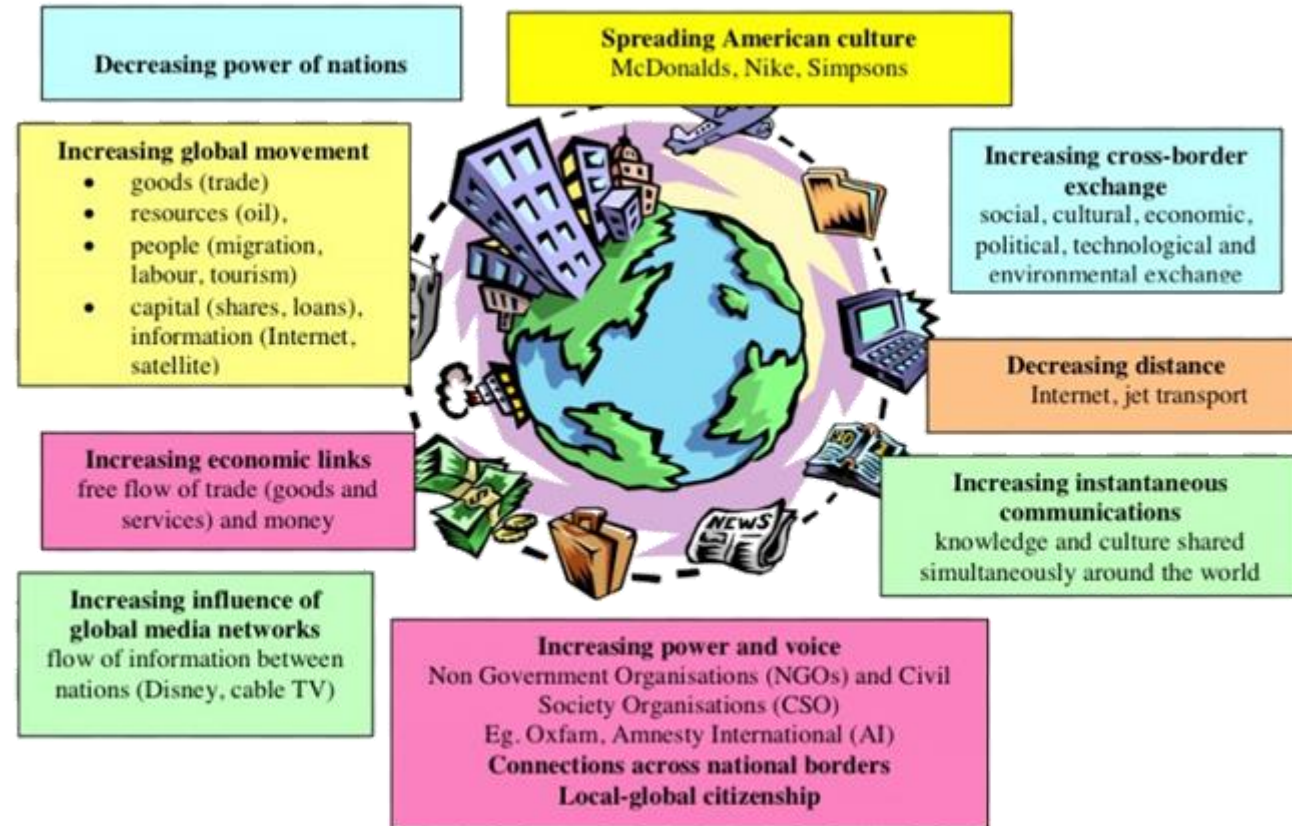


Economic entanglements that span the globe

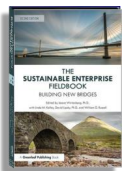
- Chained globalization
 - Resources
 - Supply chains
 - Market demand
- Flow of capital
- Culture
- Effects of climate change
- Resilience and redundancies



Some of the ways entanglement shows



https://favpng.com/png_view/globalization-globalization-economics-world-culture-economy-png/Mav7ZHRJ

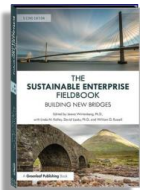


Economic/financial: revised business models and Corporate Social Responsibility

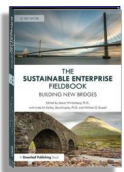
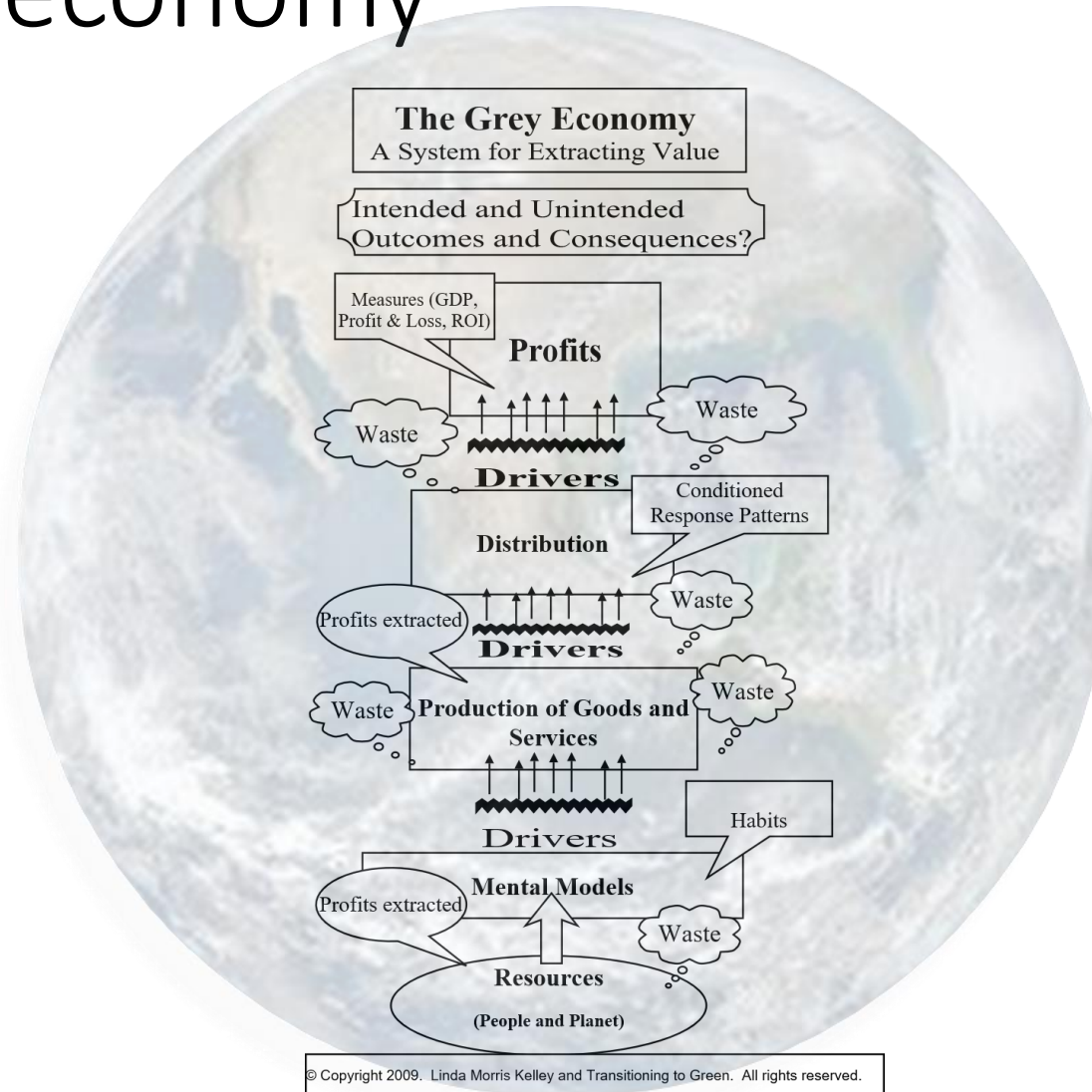
- Do corporations have social responsibilities?
- How? In what ways? Why?
- For whom is an economy designed to work?

You don't get your social license by going to a government ministry and making an application for one, or simply by paying a fee. It is not a simple case of throwing money at a problem and hoping that it goes away. It requires far more than money to truly become part of the communities in which you operate. Sit down with the local communities and understand their needs, wants and customs. Tell them what you will do and live up to your promises. Establishing that you are accountable for your actions is the key to gaining the respect of your stakeholders.

Pierre Lassonde, President Newmont Mining Corporation (2003)



Extractive economy



Circular economy

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE 1

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange



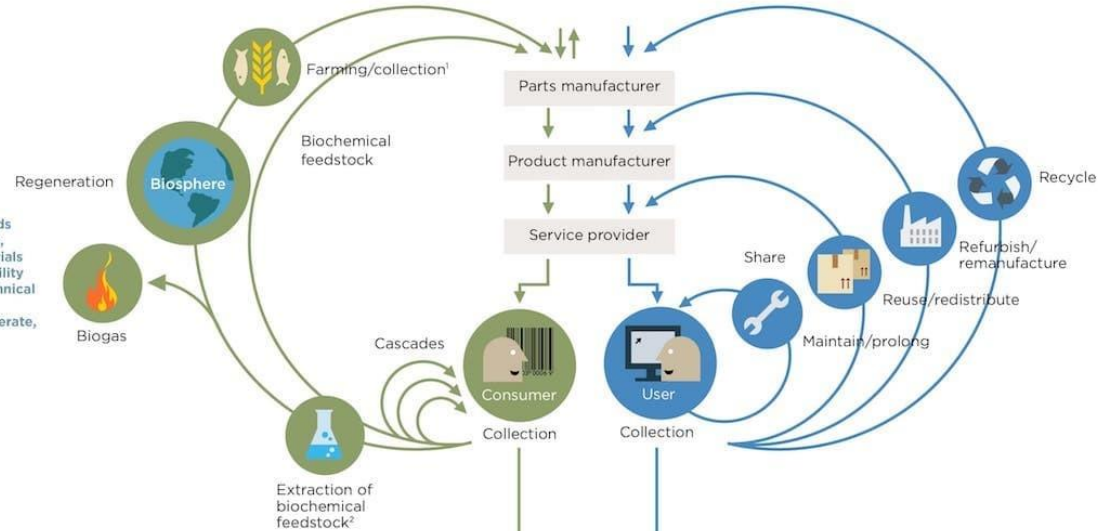
Renewables flow management

Stock management

PRINCIPLE 2

2

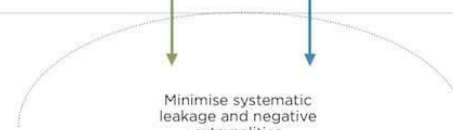
Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop



PRINCIPLE 3

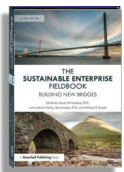
3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers

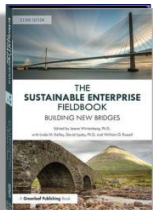


1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input
Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

<https://www.ellenmacarthurfoundation.org/circular-economy/concept/infographic>

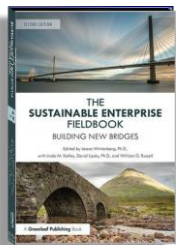


Technology lens



Artificial Intelligence

- Disaster scenario planning
- Information processing, intelligence
- Safety
- Shopping, retail
- Engineering and manufacturing
- Farming and food production
- Navigation
- Resources management
- Health and medical
- Military
- Architecture, construction and real estate
- Entertainment

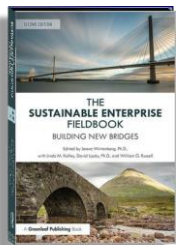


Technology: driverless cars, trucks and buses

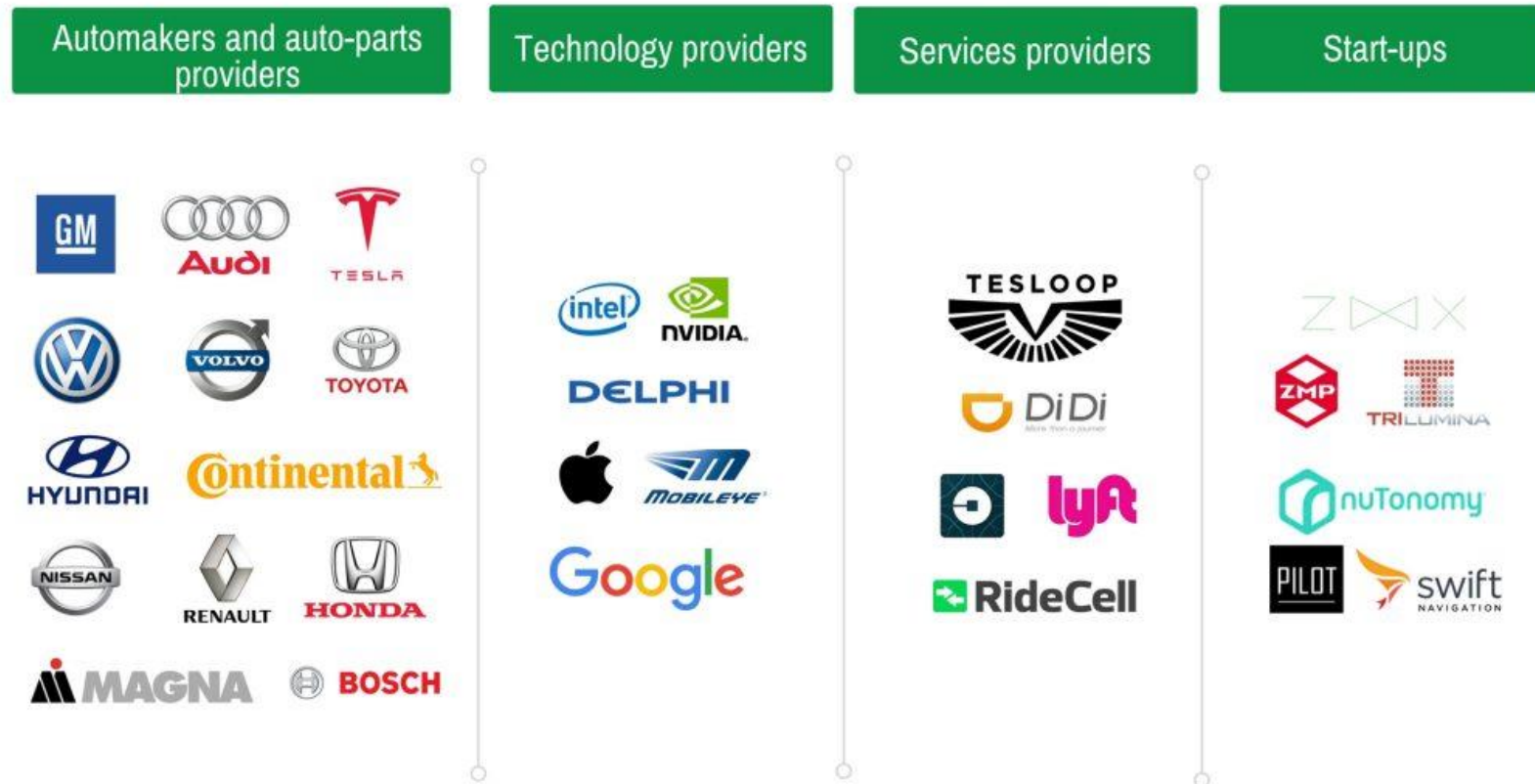


<https://www.bloomberg.com/quicktake/driverless-cars>

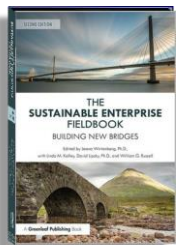
<https://www.cnbc.com/2016/10/25/driverless-beer-run-bud-makes-shipment-with-self-driving-truck.html>



Companies working on self-driving cars



<https://www.greyb.com/autonomous-vehicle-companies/>



Waymo and Nuro are testing in San Francisco

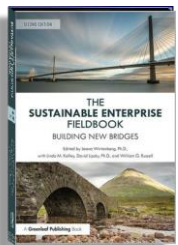
Waymo



Nuro



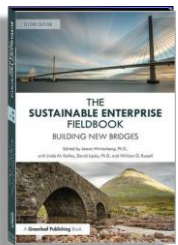
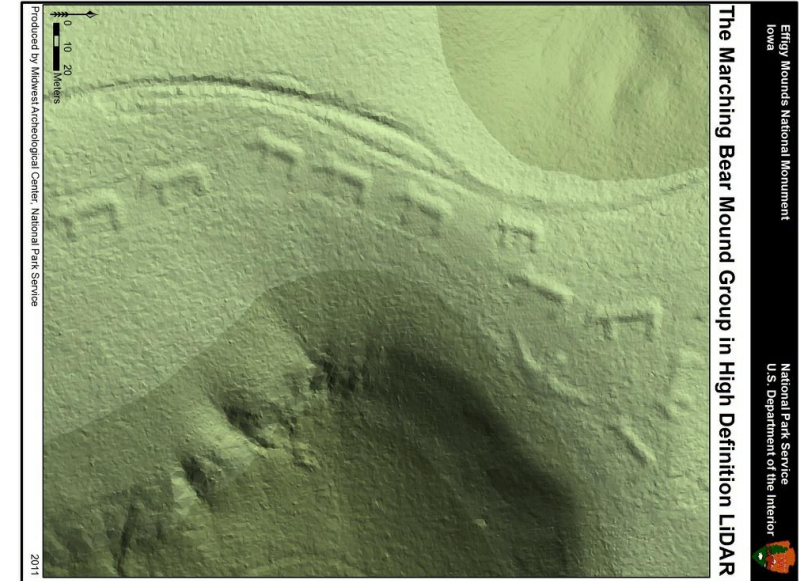
Using LIDAR technology to “see”



What LIDAR technology “sees”

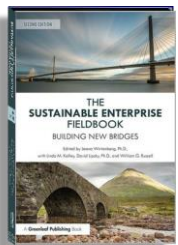
Great Bear Effigy Mounds, Iowa

LIDAR = Light imaging (ultraviolet, visible and near infrared), detection, and ranging. Bounces light off objects.



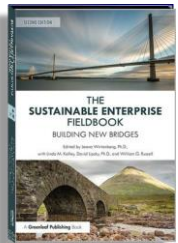
Breakout room discussions

- Self-driving vehicles as disruptive technology
- Conditions for adoption?
- Speed of adoption?
- Consequences?
 - Changes in personal and social behaviors?
 - Other new technologies?
 - Locally?
 - Globally?



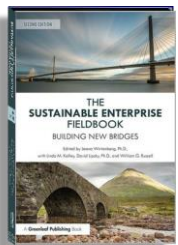
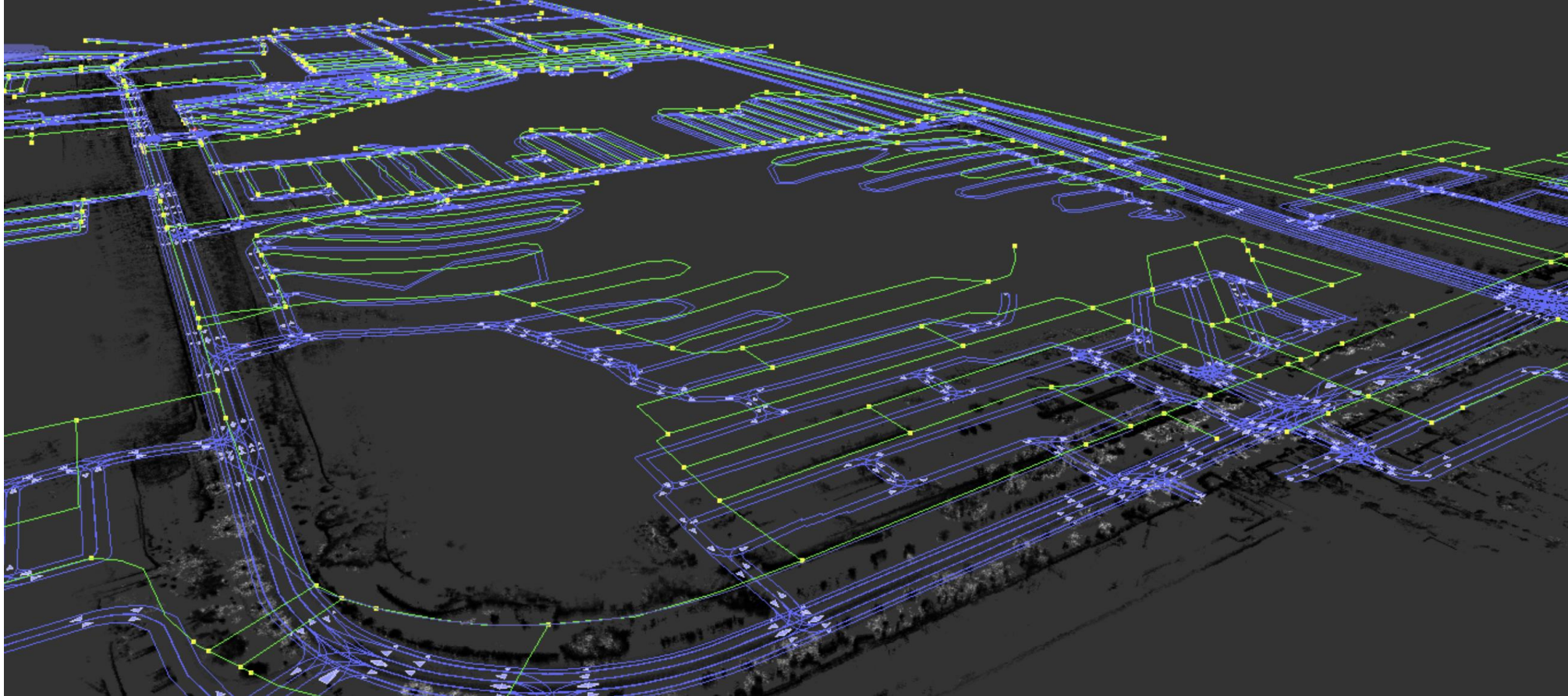


Breakout Rooms Report



Rethinking maps...for self-driving cars

<https://medium.com/lyftlevel5/https-medium-com-lyftlevel5-rethinking-maps-for-self-driving-a147c24758d6>



Reality – Current normal, augmented, virtual

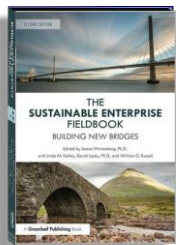
Augmented

How Augmented Reality can change brain surgery



Removing brain tumors is soon going to become easier thanks to an **augmentation of surgeons' skills**: They

<https://interestingengineering.com/augmented-reality-the-future-of-medicine>



Virtual



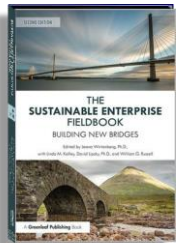
Linda Morris Kelley - Fire & Rain

Fighting fire maelstroms

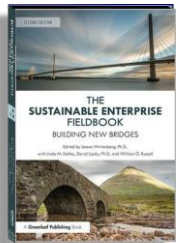
<https://www.youtube.com/watch?v=qYz2-s9MIXQ>

What are we sustaining?

Question of the day



Reflections on today?



Thank you for being here!

Preparation for **Session 3**, a) Poverty and inequity; b) Constraints on growth.
Read: p. 17-39

