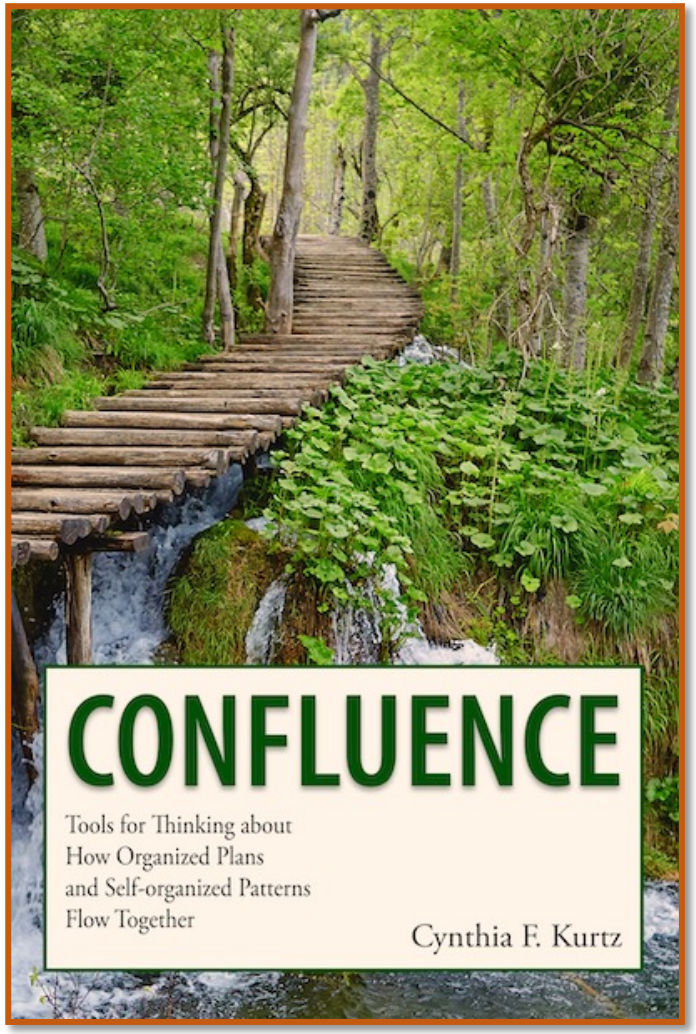
ISSS Conference 2022
Advances in Systems Sciences and Systems Practice

A brief introduction to *Confluence*

Confluence is a set of thinking tools that helps groups of people make sense of situations in which organized plans and self-organized patterns flow together.

My book (also called *Confluence)* describes the thinking tools and a group exercise that uses them.



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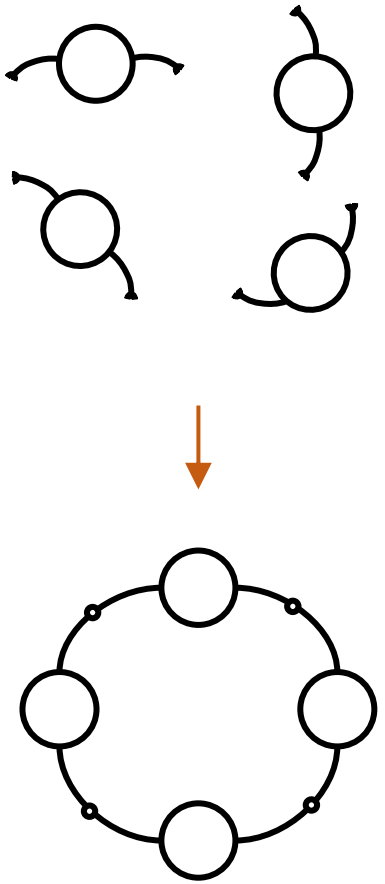
When things are free to move around and interact with their closest neighbors,

their local interactions sometimes join up to form global patterns.

Nobody builds these patterns. They form themselves.

This is called self-organization.

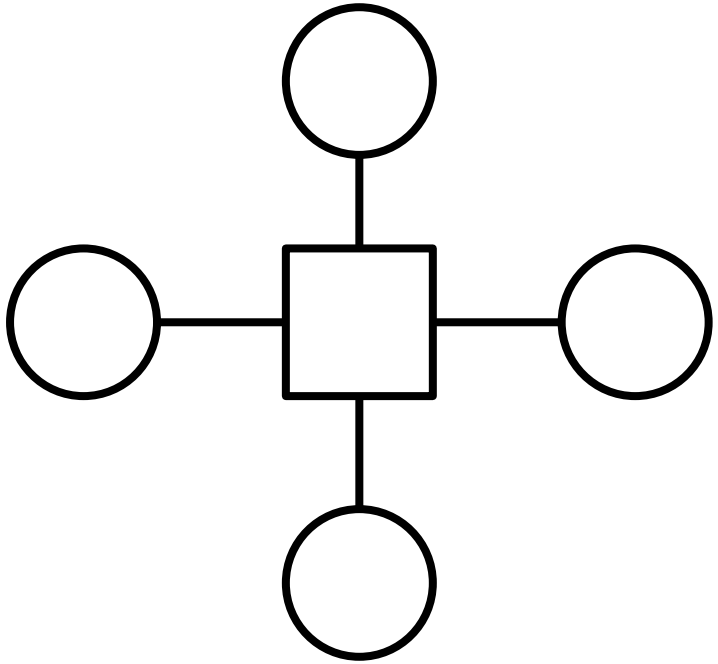
We can represent self-organization like this:



Nobody said “let’s make a circle.” It just happened.

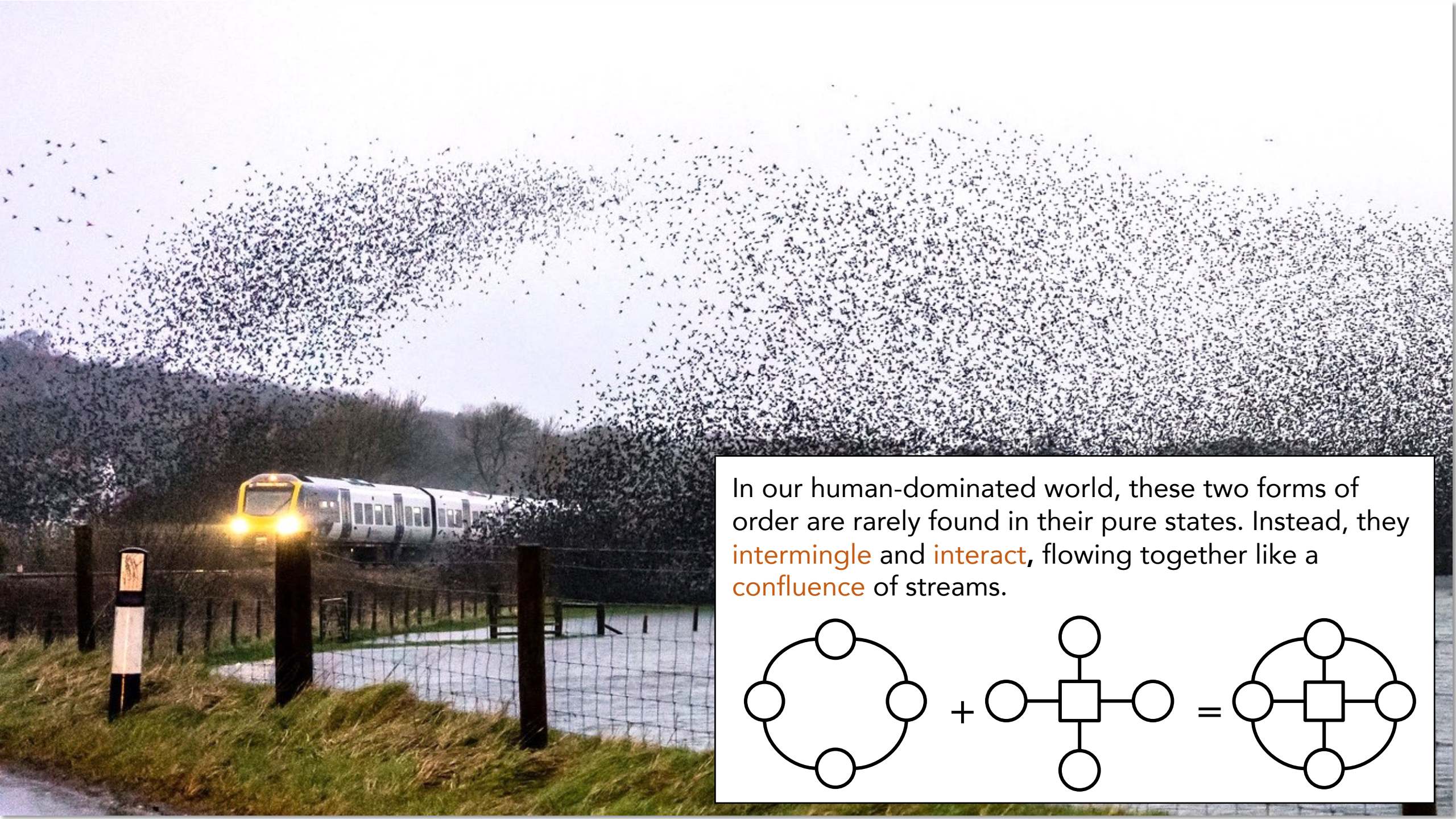
Here are some more self-organized patterns.

In contrast,
here is someone who has
put some things
where they want them to be,
on purpose.



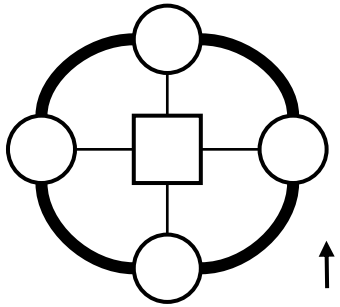
To contrast this with *self*-organization,
I call it organization.

An organizer (the square) is defined by its global awareness and access. Interactors (the circles) can only see and reach their closest neighbors.

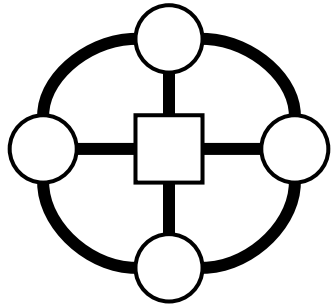


In our human-dominated world, these two forms of order are rarely found in their pure states. Instead, they intermingle and interact, flowing together like a confluence of streams.

Thinking about how these two forces intermingle and interact can help people develop better situational awareness for decision making. Especially if they think about it together.



Weak organization
Strong self-organization

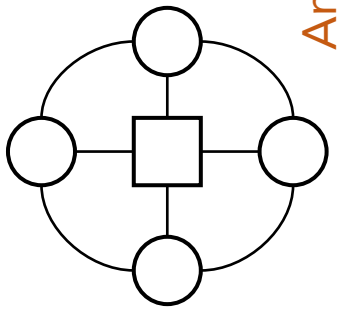


Strong organization
Strong self-organization

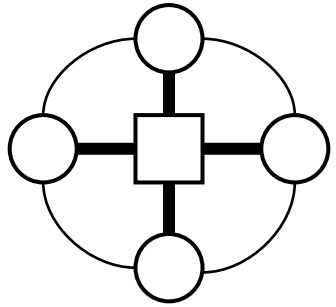
Amount of self-organization ↑

I call this a "thinking space." You use it by putting things into it and talking about why you put them where you put them.

Amount of organization →

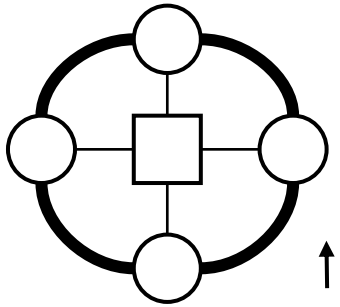


Weak organization
Weak self-organization

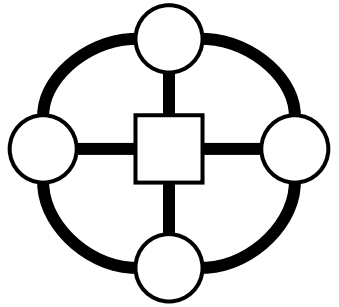


Strong organization
Weak self-organization

Thinking about how these two forces intermingle and interact can help people develop better situational awareness for decision making. Especially if they think about it together.



Weak organization
Strong self-organization



Strong organization
Strong self-organization

In this corner, self-organization is strong and organization is weak – like when a flock of starlings is flying in the sky, far from buildings and power lines.

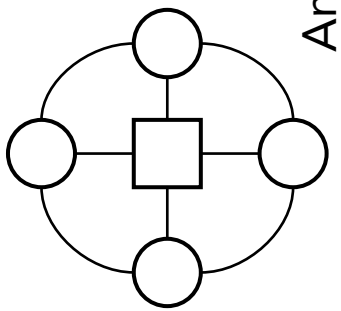
Amount of self-organization →

I call this a "thinking space." You use it by putting things into it and talking about why you put them where you put them.

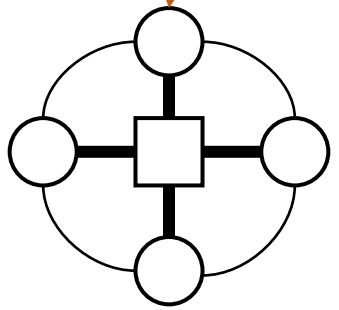
Where does a blue sky go?

Amount of organization →

In this corner, organization is strong and self-organization is weak – like when a train is sitting in an empty station, far from storms, crowds, and flocks.

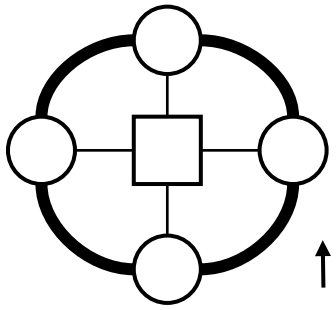


Weak organization
Weak self-organization

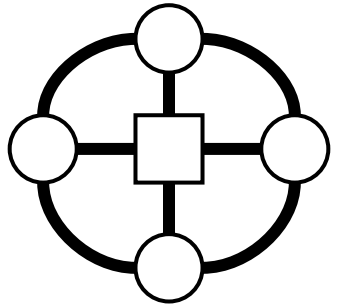


Strong organization
Weak self-organization

Disagreements about where to put things in a thinking space can be useful. Do you agree with where I put these situations?



Weak organization
Strong self-organization



Strong organization
Strong self-organization

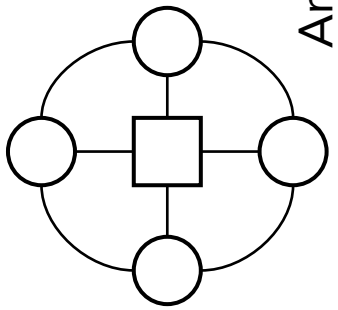
Amount of self-organization →

Emergency room

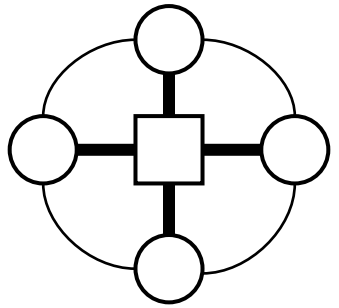
Medical emergency

Medical device cleanroom

Amount of organization →



Weak organization
Weak self-organization



Strong organization
Weak self-organization

The best way to use a thinking space is to fill it up with situations drawn from your own experiences in your family, team, community, organization, or society.

In this fictional example of a group exercise, employees placed stories into a thinking space and noticed patterns in their placements.

Weak organization
Strong self-organization

Working at FictCo: What it's really like

(in the recent past)

Strong organization
Strong self-organization

People here are so friendly

A co-worker helped me meet deadline

We had to fight for our new break room, but we love it

We all pitch in when someone is sick

We are a family

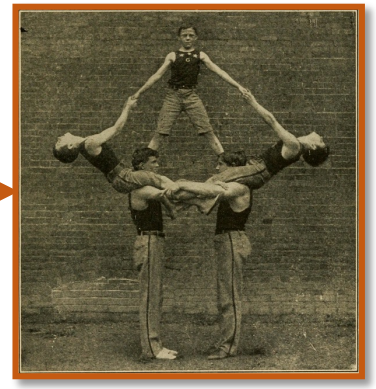
After my accident, my boss helped me set up my home office

I fixed a problem, it mattered, and I was thanked

We are a team

A co-worker who would not pitch in was let go

My boss protects me and promotes my ideas



I don't need credit! I just want my idea to make things better

We found a great solution! But we aren't about to tell management

The new "healthy living" rules are disrespectful and demeaning

Thank goodness for safety standards!

A co-worker bashed my "unproductive" creativity

Our walking group fell apart; people were afraid to be seen goofing off

I could not get them to put up a warning sign for obvious danger

Why the speed bumps? Don't they trust us?

We are a paradox

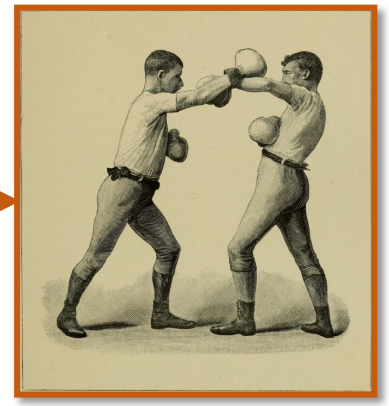
We are divided

My boss smile at the customers, but don't try to help them!

My boss killed my good idea

My co-worker was fired for no reason

He was banned from the building the day after his retirement



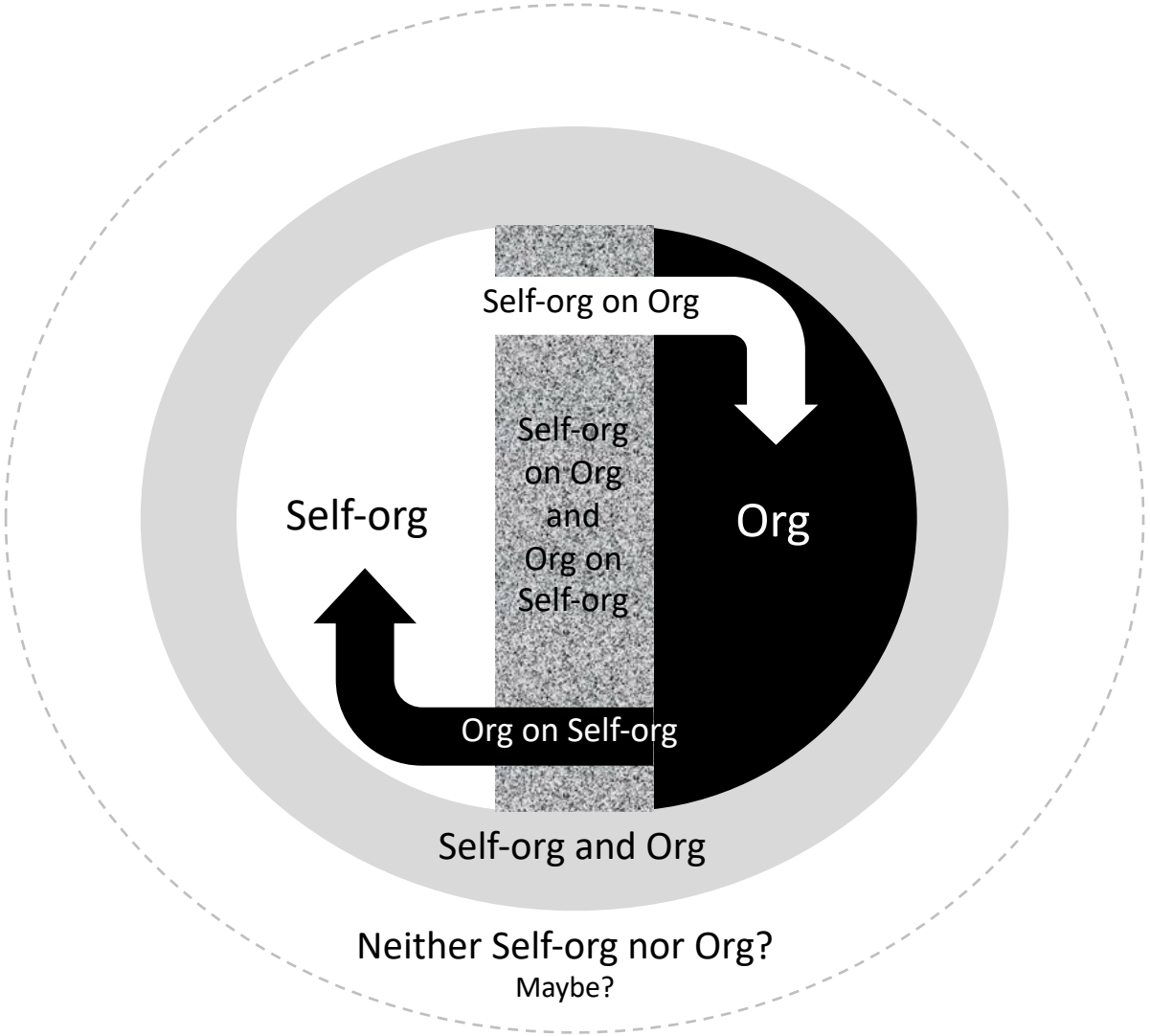
Weak organization
Weak self-organization

Strong organization
Weak self-organization

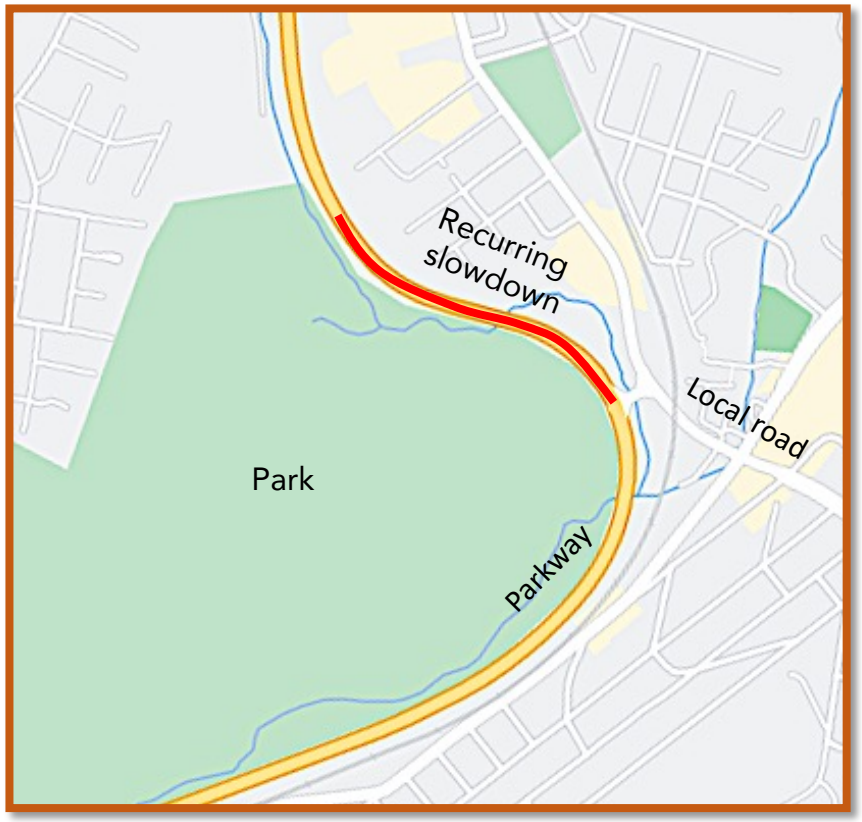
There are seven thinking spaces in the *Confluence* toolset. Each space supports a different situational awareness goal. Choose a space that matches what you want to think about.

1. Self-org and Org – Confluence
2. Only Self-org – The Jungle
3. Only Org – The Plan
4. How Self-org pushes on Org – Inundation
5. How Org pushes on Self-org – Regulation
6. How Self-org and Org push on each other – The Mix
7. How Self-org and Org might be unclear or disputed – Connecting the Dots

You can use the same group exercise with any or all of the spaces.



To delve deeper into the
Confluence toolset,
let's follow a single example
across all seven thinking spaces.



The spot on the Saw Mill River Parkway (in Westchester, New York) where this story takes place.
Map data © 2022 Google.

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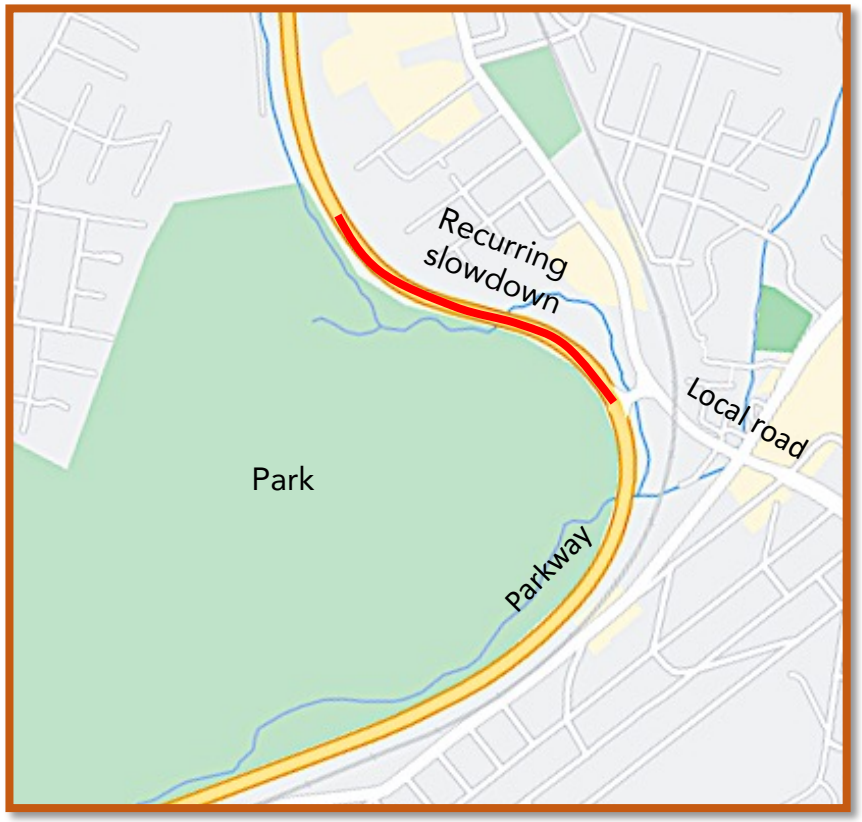


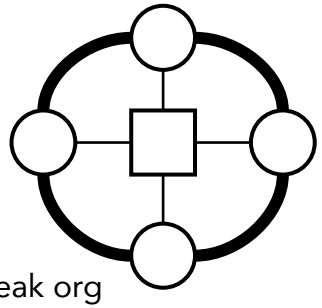
The spot on the Saw Mill River Parkway (in Westchester, New York) where this story takes place.
Map data © 2022 Google.

WARNING

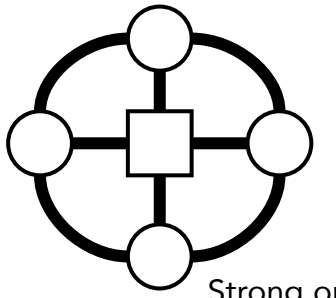
I know almost nothing about
road design or traffic control.

My goal is not to explain how traffic works. It is to use the toolset in front of you to show how you can use it to think about situations you care about.

The Confluence Thinking Space

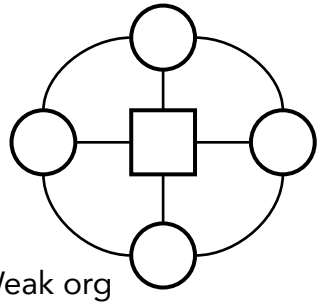


Weak org
Strong self-org



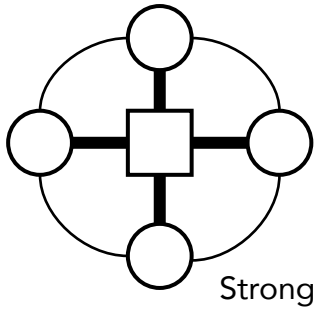
Strong org
Strong self-org

Self-organization →

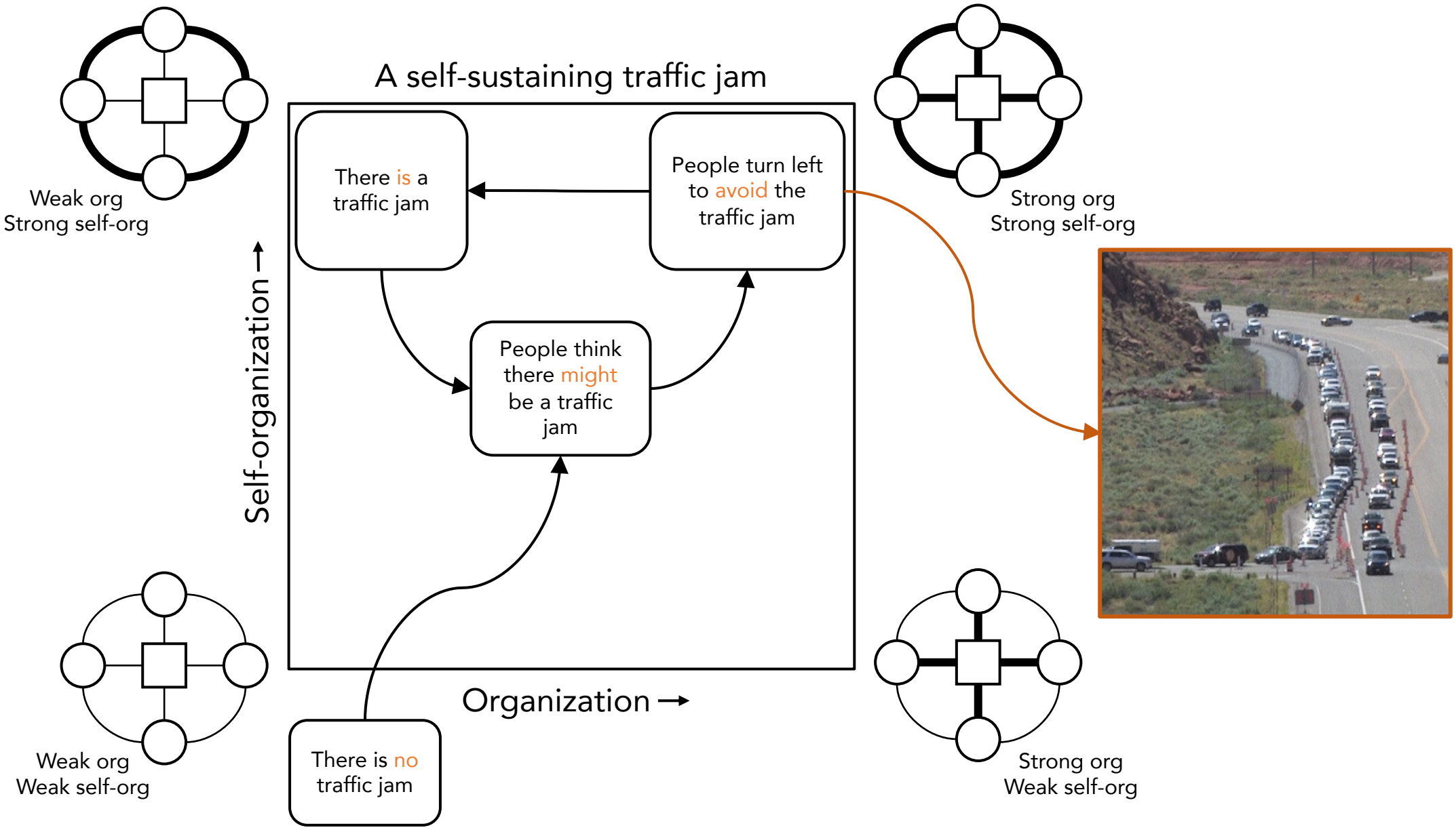


Weak org
Weak self-org

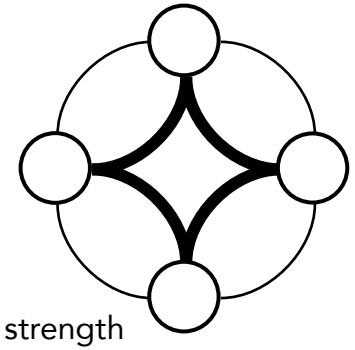
Organization →



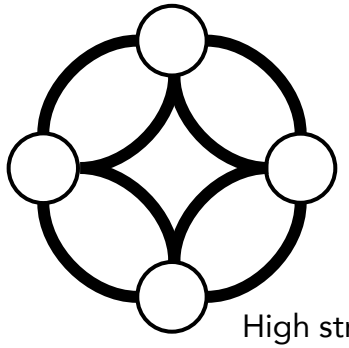
Strong org
Weak self-org


A self-sustaining traffic jam
There is a traffic jam
People turn left to avoid the traffic jam
People think there might be a traffic jam
There is no traffic jam
Self-organization →
Organization →
Weak org
Strong self-org
Strong org
Strong self-org
Weak org
Weak self-org
Strong org
Weak self-org

The Jungle Thinking Space



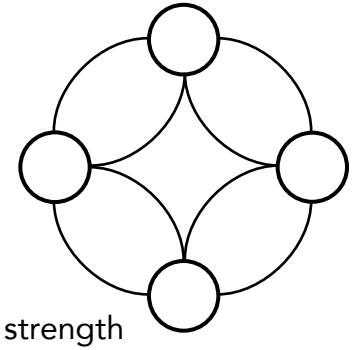
Low strength
High resilience



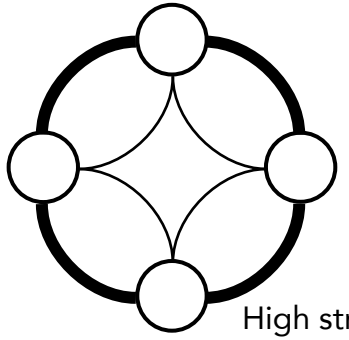
High strength
High resilience

Resilience →

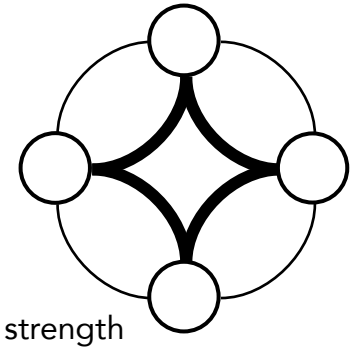
Strength →



Low strength
Low resilience

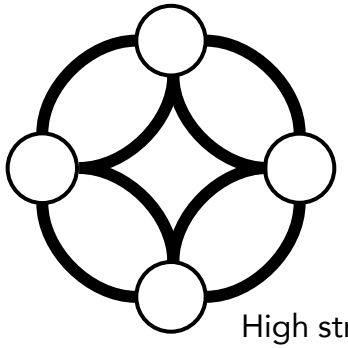


High strength
Low resilience



Low strength
High resilience

Turn left?

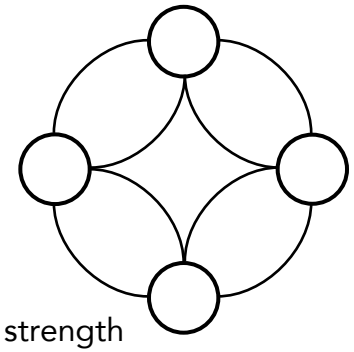


High strength
High resilience

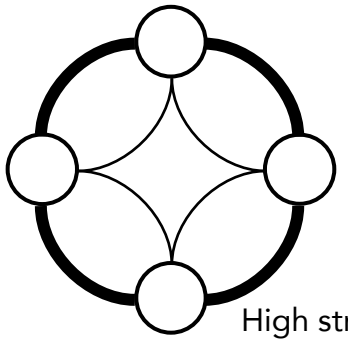
Resilience →

Will a driver join the left-turn queue, creating the jam they seek to avoid?

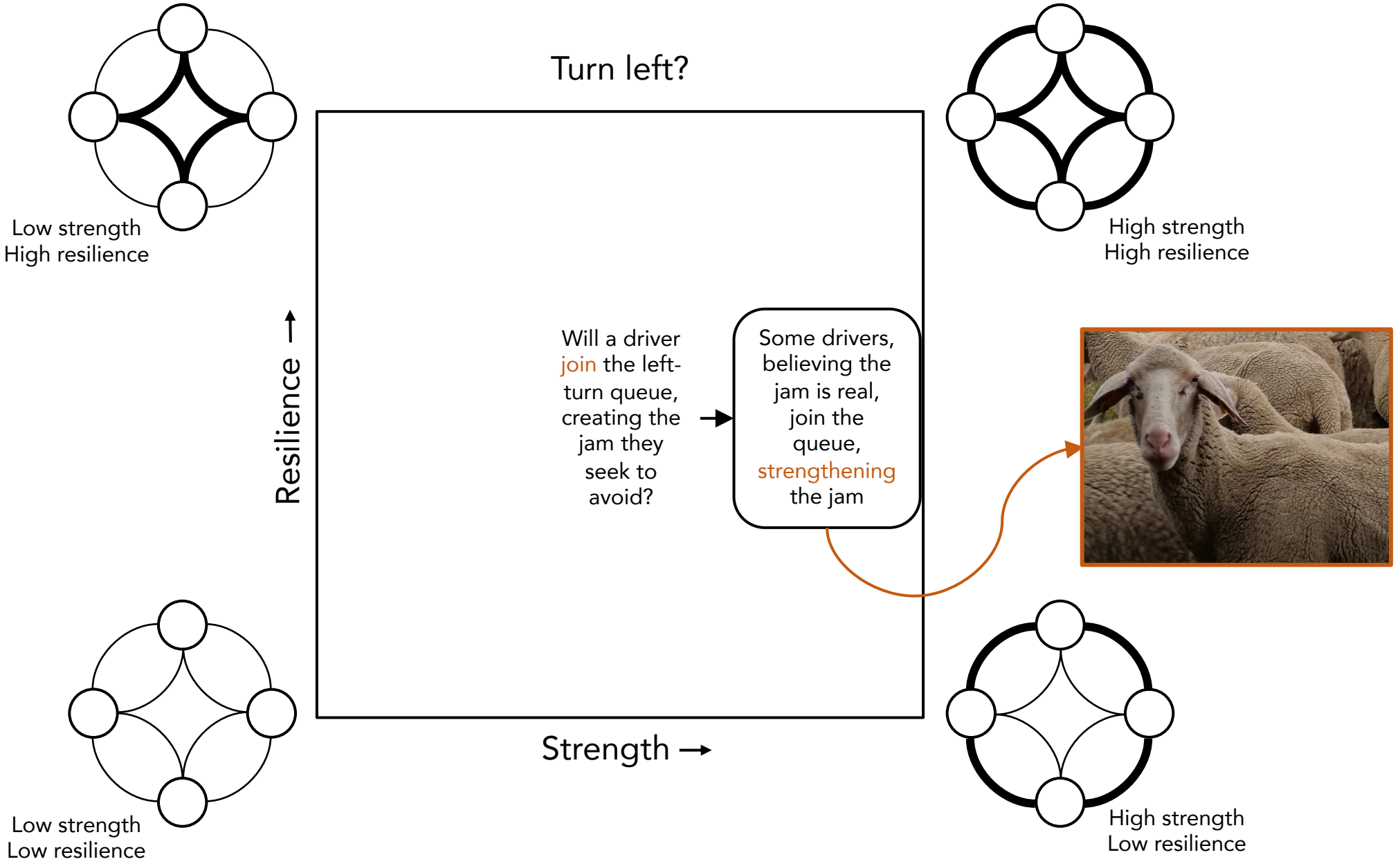
Strength →

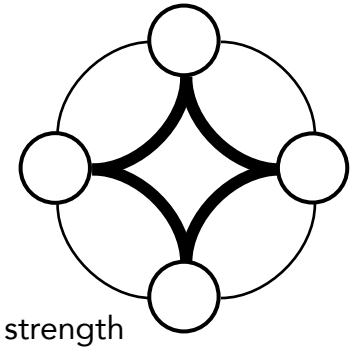


Low strength
Low resilience



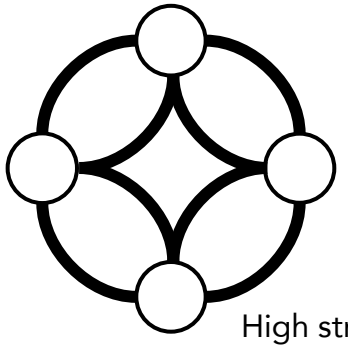
High strength
Low resilience


Turn left?
Low strength
High resilience
High strength
High resilience
Resilience →
Will a driver join the left-turn queue, creating the jam they seek to avoid?
Some drivers, believing the jam is real, join the queue, strengthening the jam
Low strength
Low resilience
Strength →
High strength
Low resilience



Low strength
High resilience

Turn left?



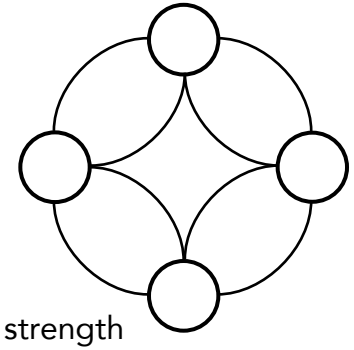
High strength
High resilience

Resilience →

Some drivers, believing the jam is ephemeral, stay in their lanes, weakening the jam

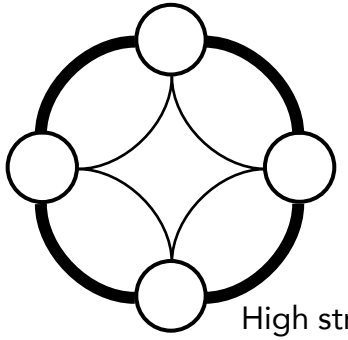
Will a driver join the left-turn queue, creating the jam they seek to avoid?

Some drivers, believing the jam is real, join the queue, strengthening the jam

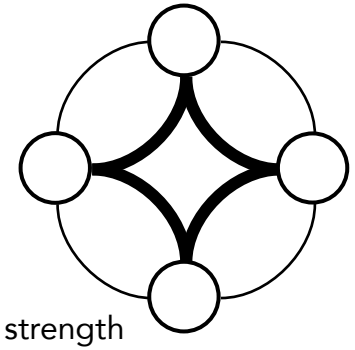


Low strength
Low resilience

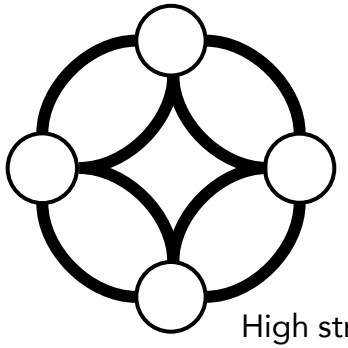
Strength →



High strength
Low resilience



Low strength
High resilience



High strength
High resilience

Turn left?

Lack of communication renders the pattern resilient to change, despite the enlightenment of individual drivers

Resilience →

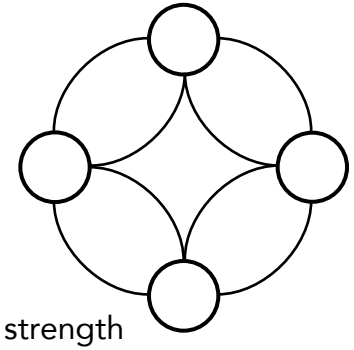
Some drivers, believing the jam is ephemeral, stay in their lanes, weakening the jam

Will a driver join the left-turn queue, creating the jam they seek to avoid?

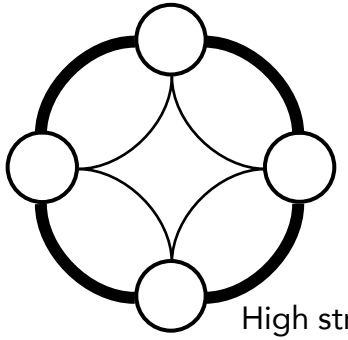
Some drivers, believing the jam is real, join the queue, strengthening the jam

Increased communication might cause jams to dissipate sooner

Strength →

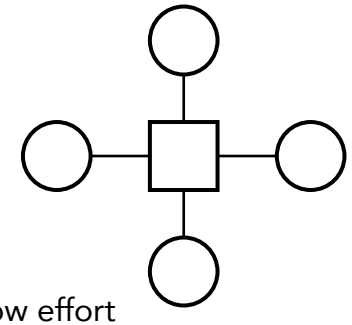


Low strength
Low resilience

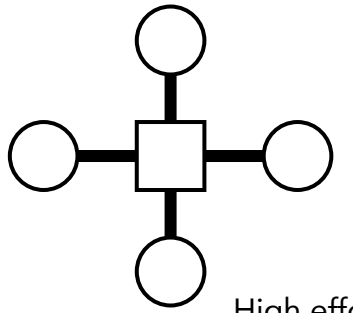


High strength
Low resilience

The Plan Thinking Space



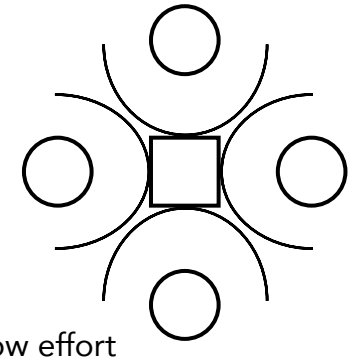
Low effort
High awareness



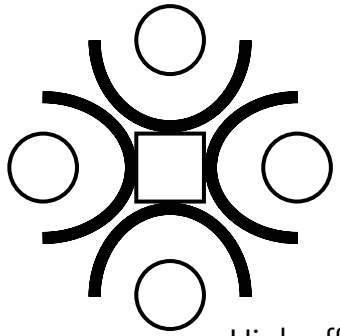
High effort
High awareness

Awareness →

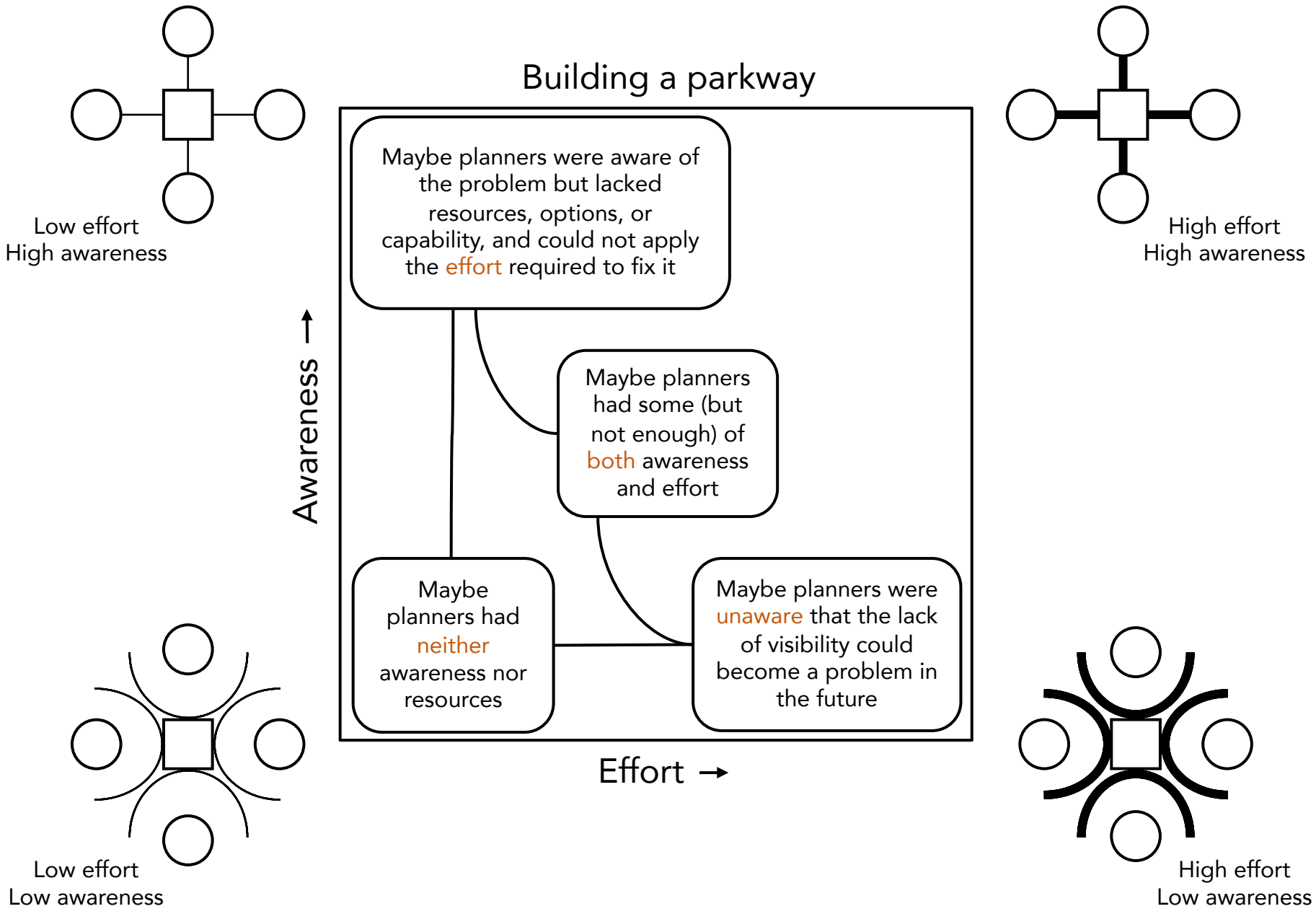
Effort →



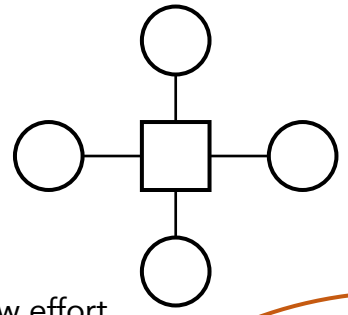
Low effort
Low awareness



High effort
Low awareness


Building a parkway
Maybe planners were aware of the problem but lacked resources, options, or capability, and could not apply the effort required to fix it
Maybe planners had some (but not enough) of both awareness and effort
Maybe planners had neither awareness nor resources
Maybe planners were unaware that the lack of visibility could become a problem in the future
Awareness →
Effort →
Low effort
High awareness
High effort
High awareness
Low effort
Low awareness
High effort
Low awareness

Map data © 2022 Google



Low effort
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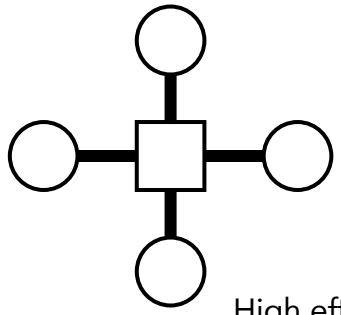
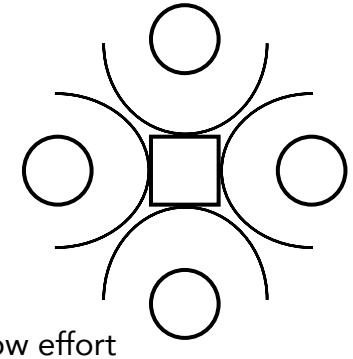
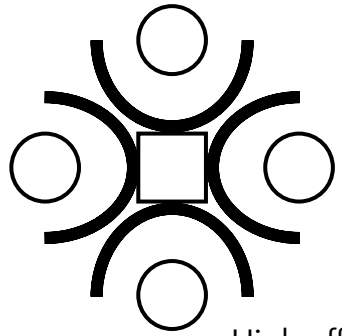


High effort
High awareness



Low effort
Low awareness

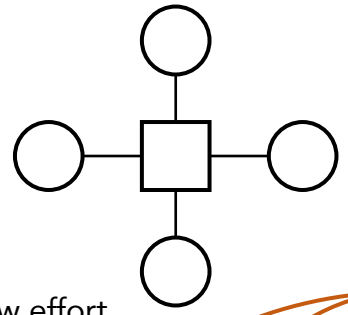


High effort
Low awareness

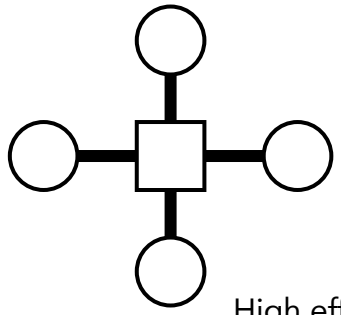
Map data © 2022 Google

"Parkways are beautifully designed roads and often include pull offs where visitors can enjoy scenic views. During the 1930s, many parkways were designed as part of the national park system as job creation projects."

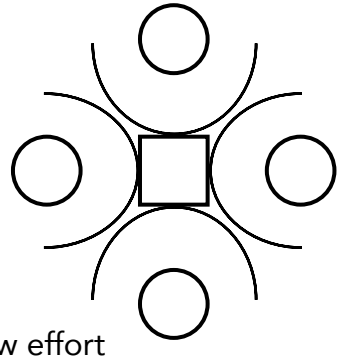
US National Parks Service



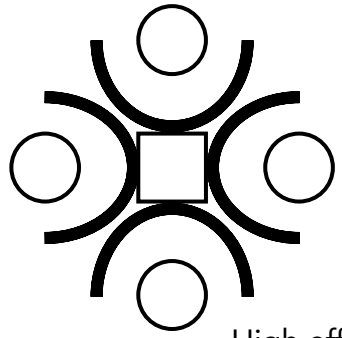
Low effort
High awareness



High effort
High awareness



Low effort
Low awareness



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Building a parkway

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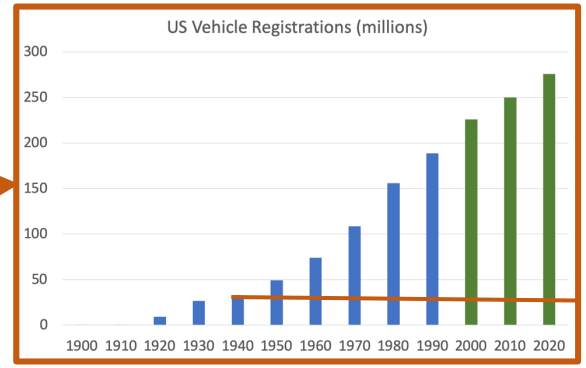
Effort →

Low effort
Low awareness

High effort
High awareness



1900-1990 (blue)
https://www.fhwa.dot.gov/ohim/summary95/mv200.pdf
2000-2020 (green)
https://www.statista.com/statistics/183505/number-of-vehicles-in-the-united-states-since-1990

High effort
Low awareness

Building a parkway

Map data © 2022 Google

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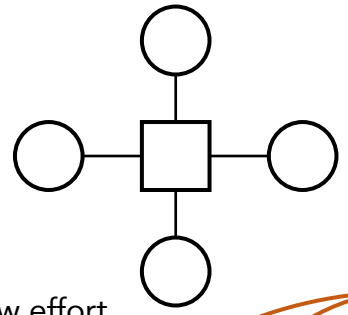
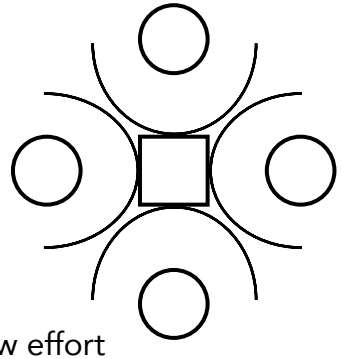


Low effort
High awareness



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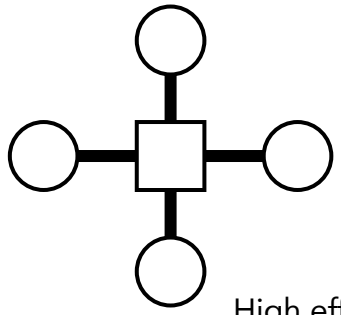
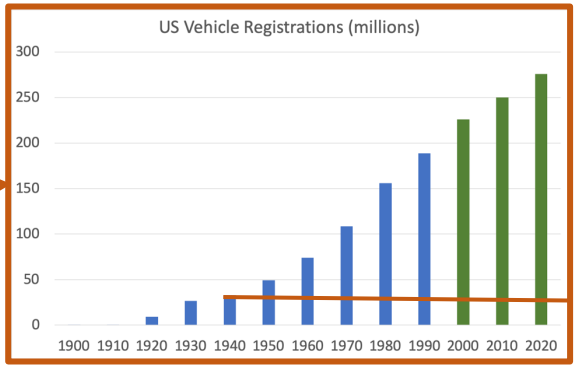


High effort
High awareness



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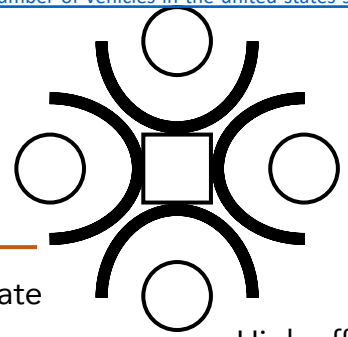
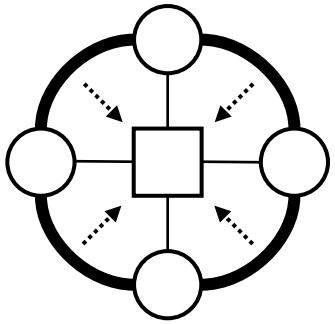


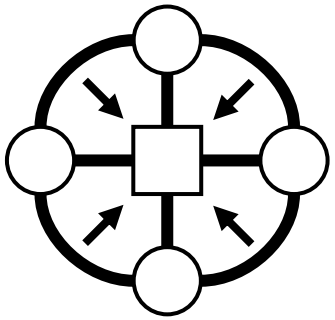
High effort
Low awareness

"The design of highways must permit the driver to anticipate ahead.... It is unfortunate that so little is known about the important factor of anticipation in driving." Gordon, D. A. (1966). Perceptual basis of vehicular guidance: I-V. *Public Roads*, 34(3), 53–68.

The Inundation Thinking Space

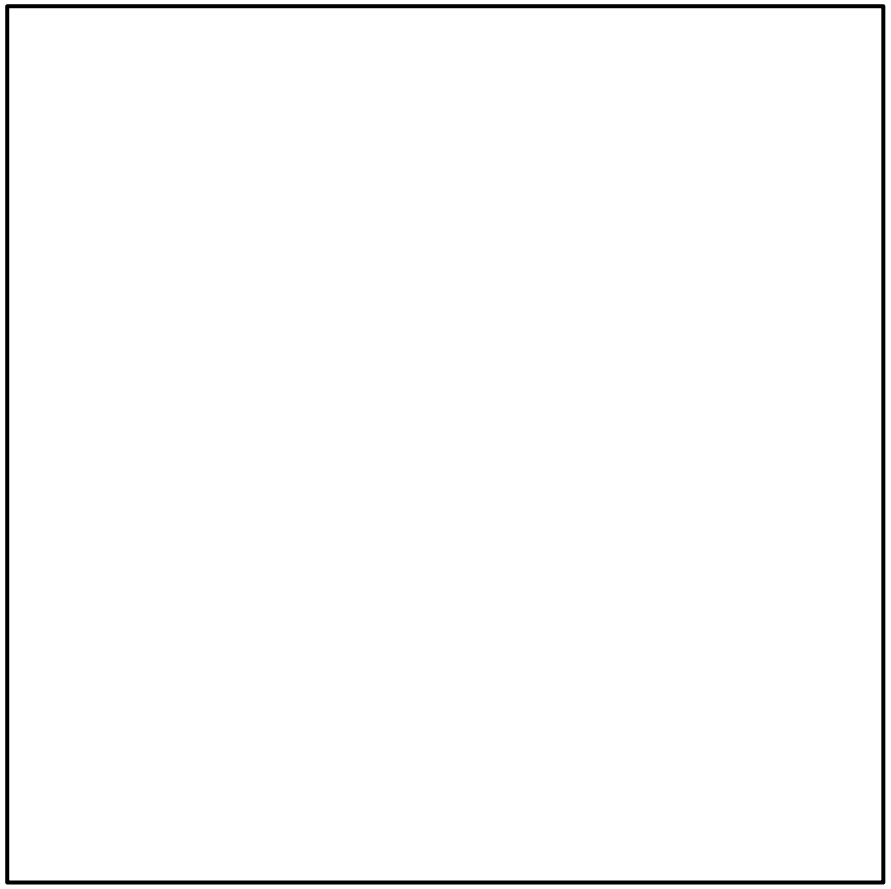


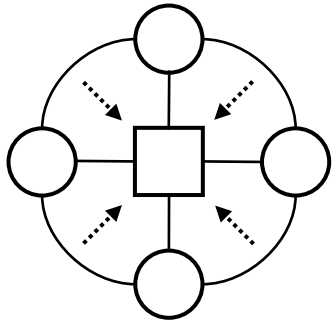
Org destroyed by strong self-org



Org preserved by strong self-org

Self-organization →

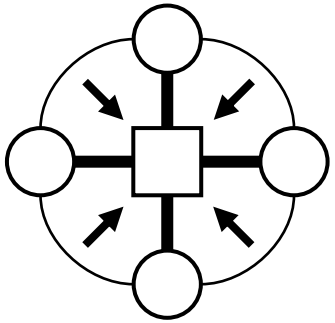




Org destroyed by weak self-org

← Destruction Preservation →

Effect on organization



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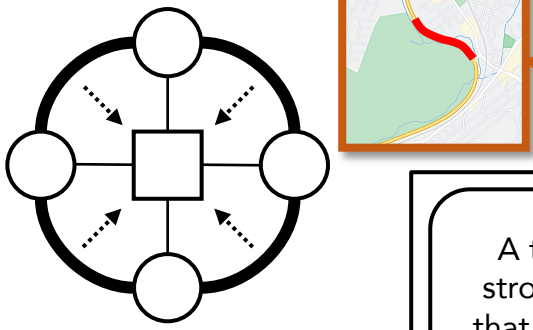
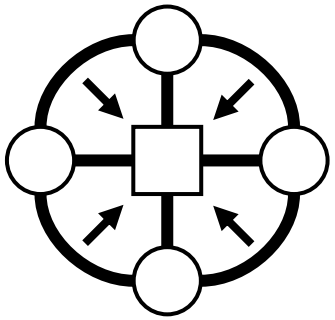


Org destroyed by strong self-org

A flood of traffic

A traffic jam is a strong SO pattern that destroys driver plans



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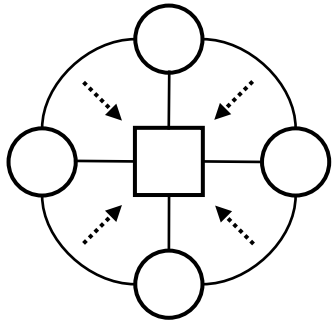
Self-organization →

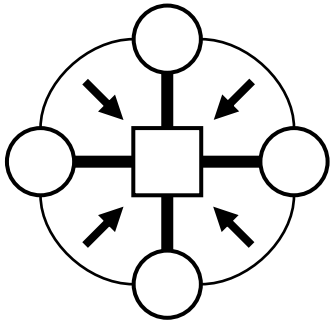


Org destroyed by weak self-org

← Destruction

Preservation →

Effect on organization



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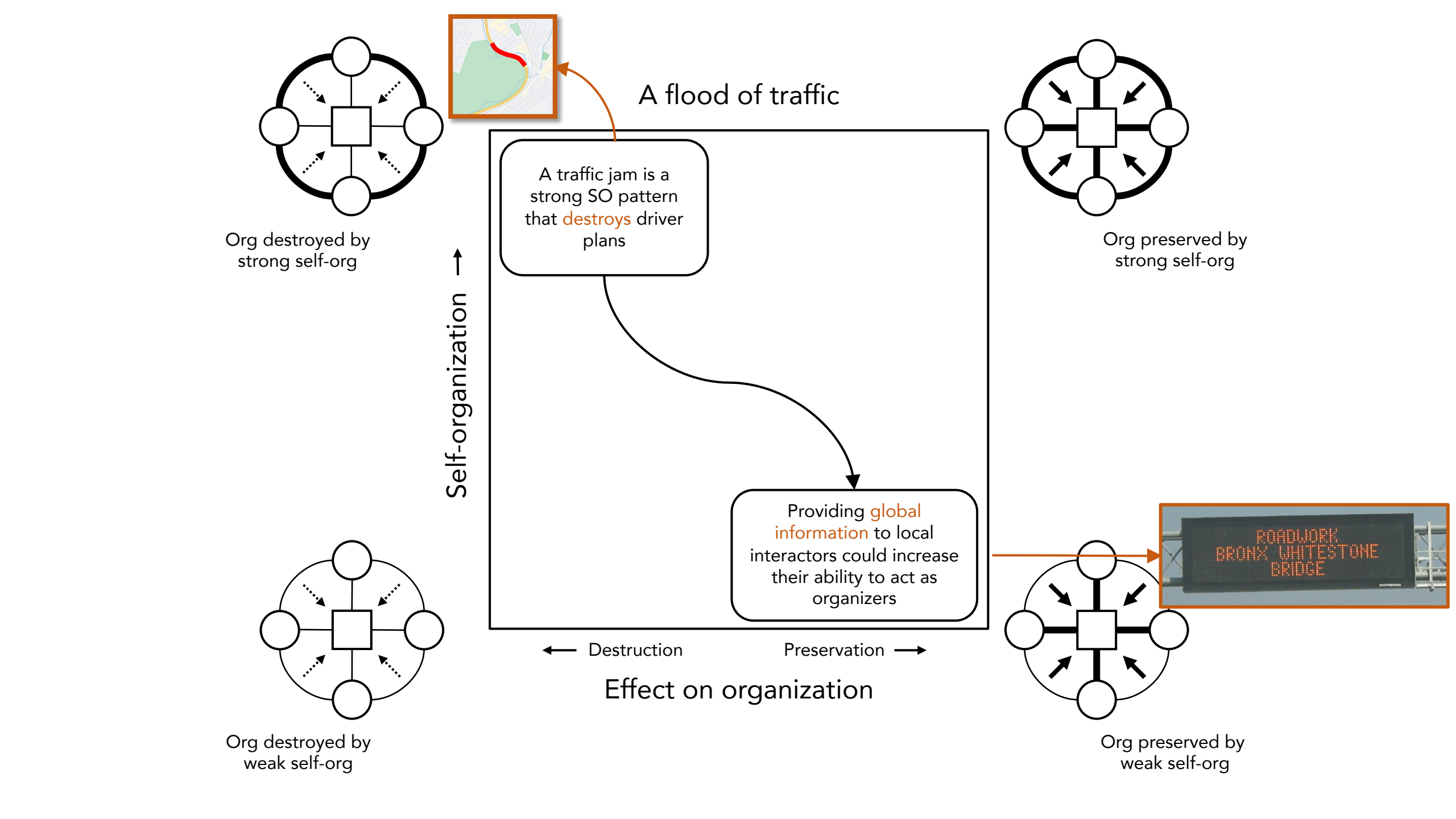
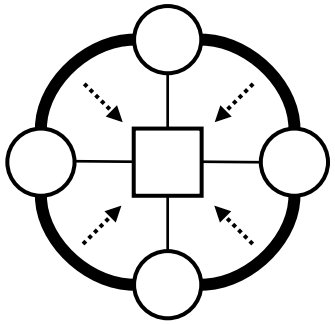

A flood of traffic
A traffic jam is a strong SO pattern that destroys driver plans
Providing global information to local interactors could increase their ability to act as organizers
Self-organization
Destruction
Preservation
Effect on organization
Org destroyed by strong self-org
Org preserved by strong self-org
Org destroyed by weak self-org
Org preserved by weak self-org
ROADWORK
BRONX WHITESTONE
BRIDGE

A flood of traffic



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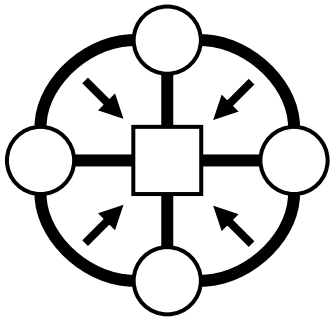


Org preserved by strong self-org

Self-organization →

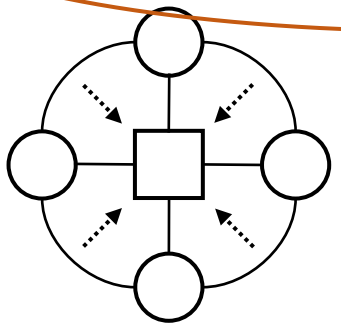
A traffic jam is a strong SO pattern that destroys driver plans

The weakness of more useful SO patterns could be part of the problem

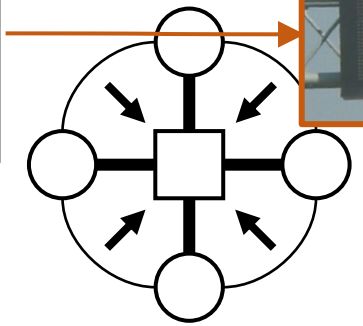
Providing global information to local interactors could increase their ability to act as organizers

← Destruction Preservation →

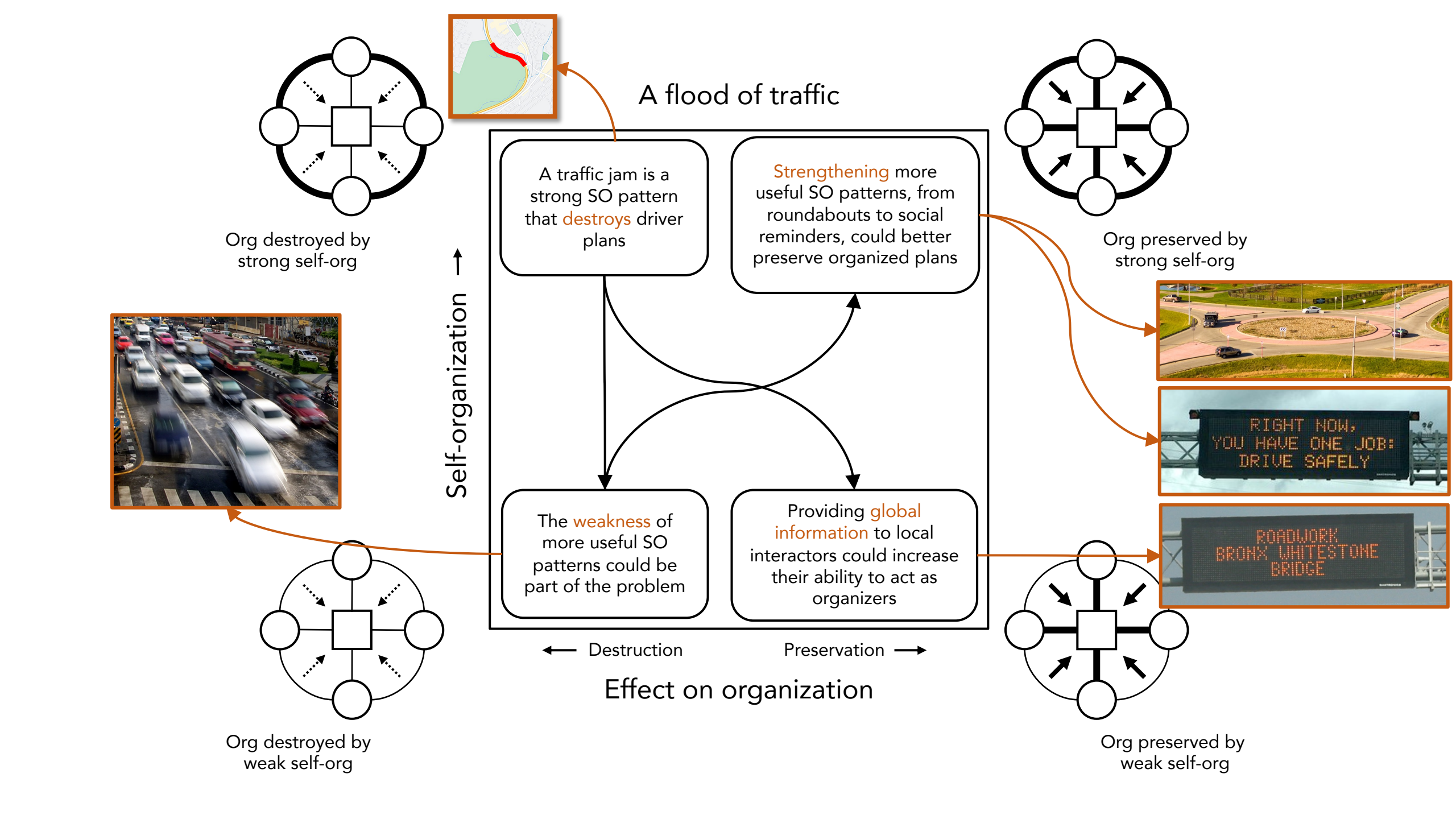
Effect on organization



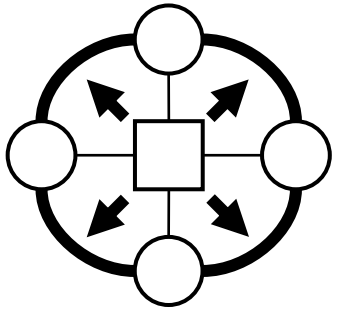
Org destroyed by weak self-org



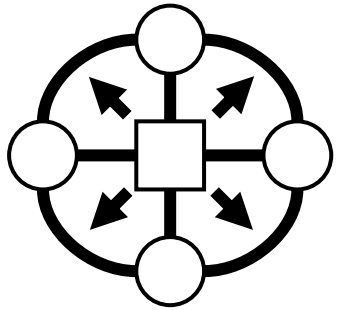
Org preserved by weak self-org


A flood of traffic
A traffic jam is a strong SO pattern that destroys driver plans
Strengthening more useful SO patterns, from roundabouts to social reminders, could better preserve organized plans
The weakness of more useful SO patterns could be part of the problem
Providing global information to local interactors could increase their ability to act as organizers
Self-organization
Destruction
Preservation
Effect on organization
Org destroyed by strong self-org
Org preserved by strong self-org
Org destroyed by weak self-org
Org preserved by weak self-org
RIGHT NOW, YOU HAVE ONE JOB: DRIVE SAFELY
ROADWORK BRONX WHITESTONE BRIDGE

The Regulation Thinking Space



Weak org
preserves self-org



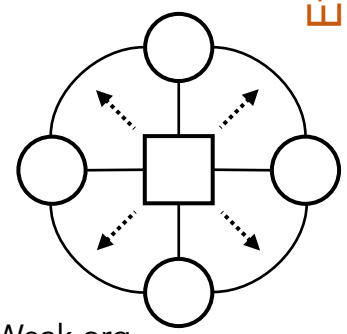
Strong org
preserves self-org

Effect on self-organization

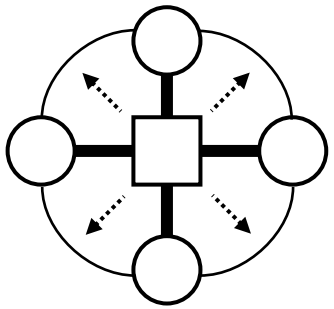
Preservation ↑

Destruction ↓

Organization →



Weak org
destroys self-org



Strong org
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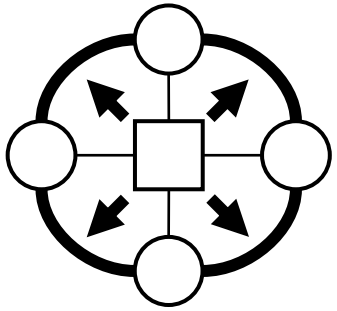

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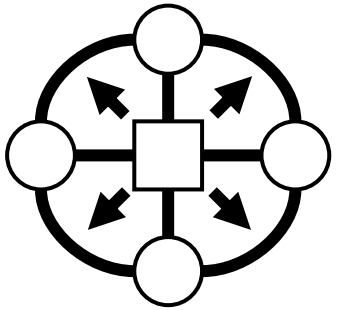


Strong org
preserves self-org

Stemming the flood

Effect on self-organization

Preservation →

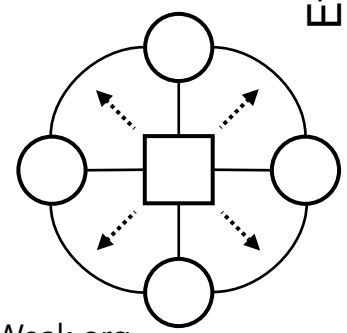
← Destruction

Teach drivers how slowdowns form and how to avoid creating them

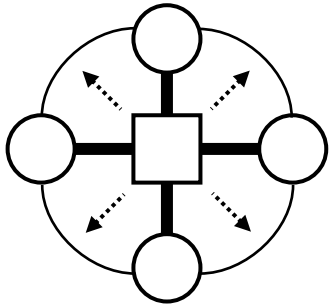
Lengthen left-turning lane to lessen effect of queuing

Constantly update road signs and car displays with global information on upcoming traffic

Organization →

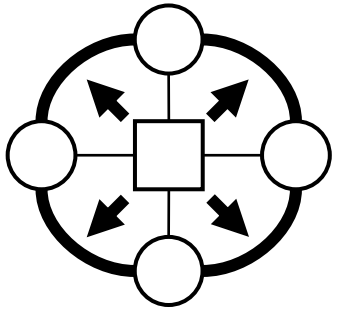


Weak org
destroys self-org



Strong org
destroys self-org

Closing one flood gate, opening another



Weak org
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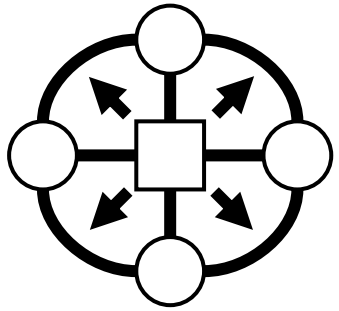


Strong org
preserves self-org

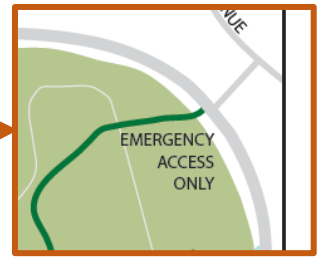
Effect on self-organization

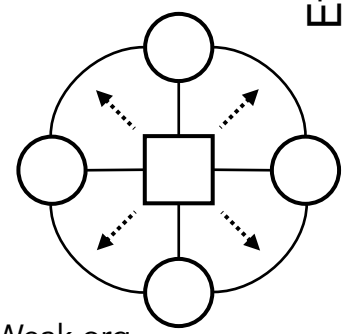
Preservation →

← Destruction

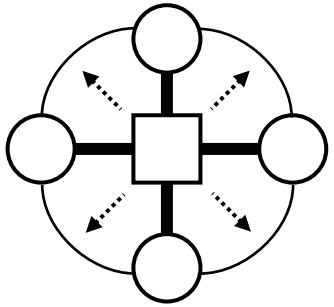
Create traffic-tips forum for regular commuters	Allow part-time shoulder use	Design cars that send and receive look-back traffic reports, causing info to ripple back and reduce anticipatory congestion
	Add third lane in slowdown area	
Remind drivers of social norms	Allow right turns onto park road (always or during congestion)	
Teach drivers how slowdowns form and how to avoid creating them	Lengthen left-turning lane to lessen effect of queuing	Constantly update road signs and car displays with global information on upcoming traffic

Organization →



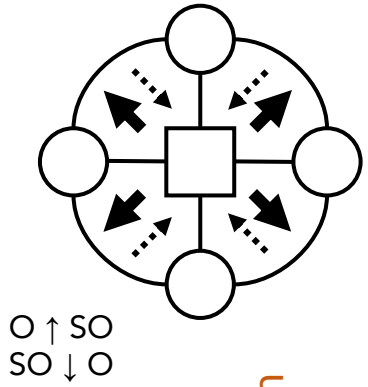


Weak org
destroys self-org

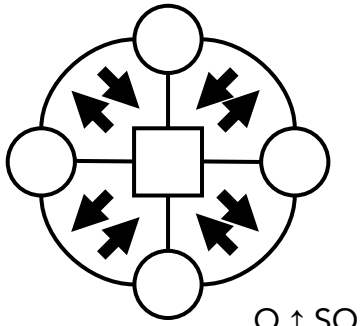


Strong org
destroys self-org

The Mix Thinking Space



O ↑ SO
SO ↓ O

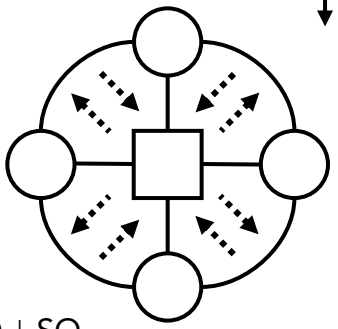


O ↑ SO
SO ↑ O

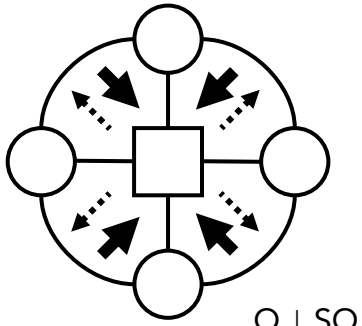
Effect of organization on self-organization

Preservation

Destruction



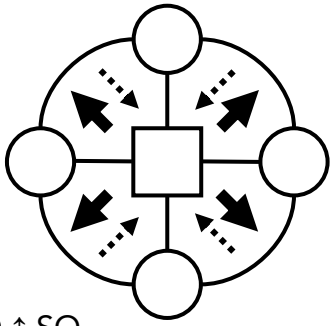
O ↓ SO
SO ↓ O



O ↓ SO
SO ↑ O

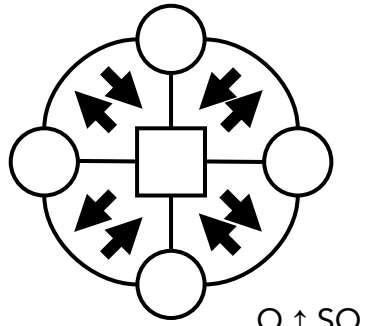
← Destruction Preservation →

Effect of self-organization on organization



O ↑ SO
SO ↓ O

Everything all at once

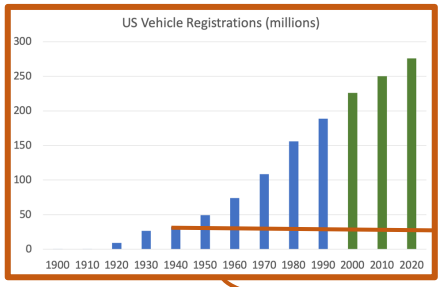


O ↑ SO
SO ↑ O

Effect of organization on self-organization

Preservation →

Destruction ←

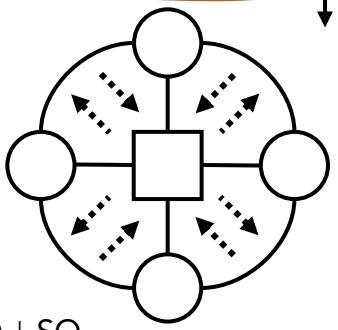


There are a lot more cars than there were in 1940

Now we can play with helpful simulated SO patterns

"Data-driven methods and [simulation] models now make it possible to pursue a more precise quantification of bottlenecks ... [and] put a more precise price tag on transportation investments."

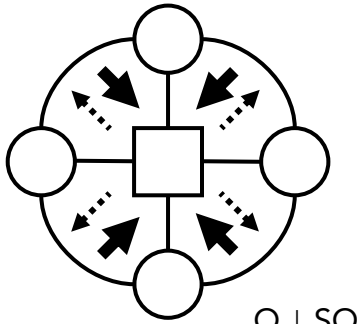
US DoT. (2016). *Traffic Bottlenecks: Identification and Solutions.*



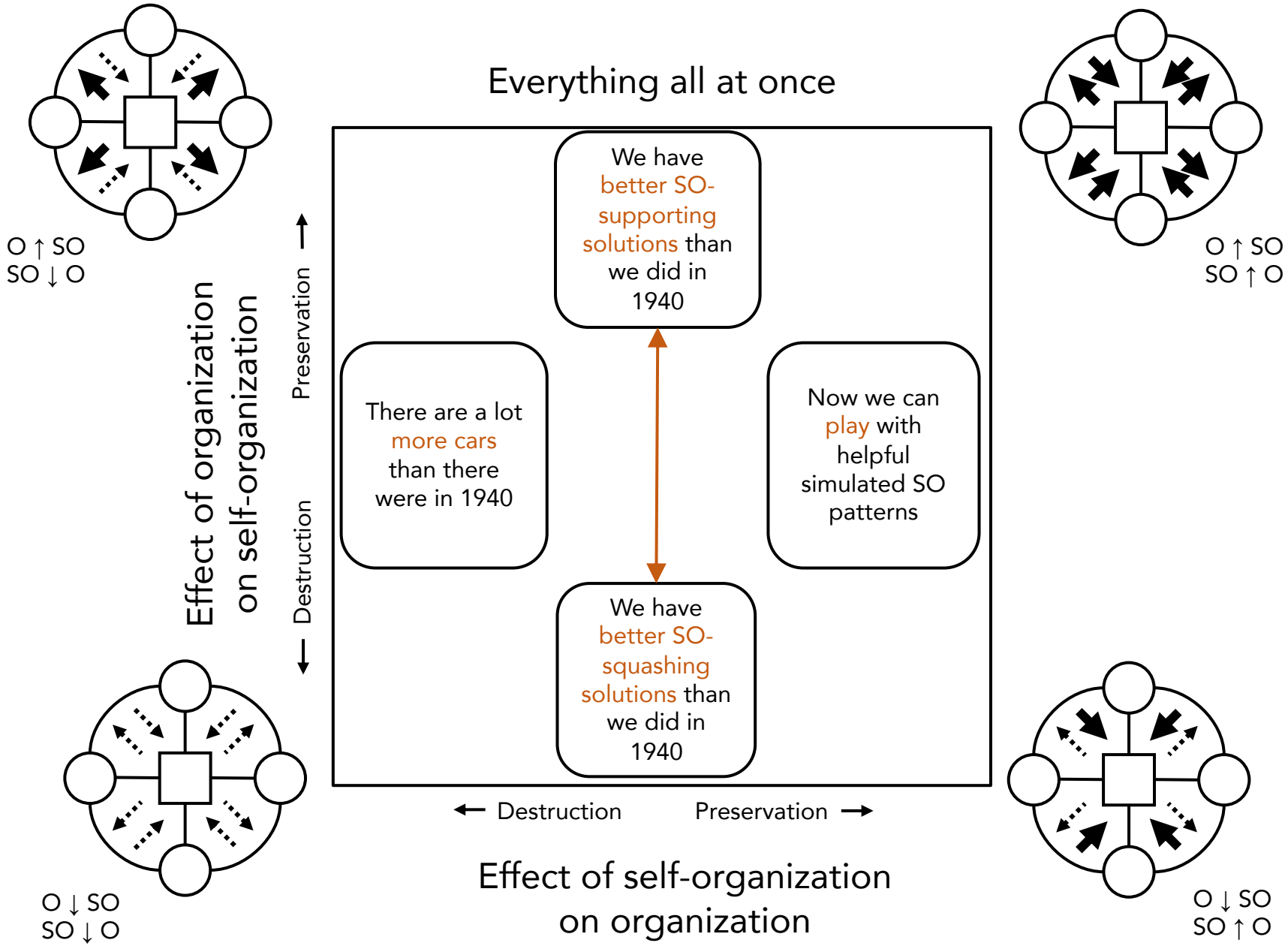
O ↓ SO
SO ↓ O

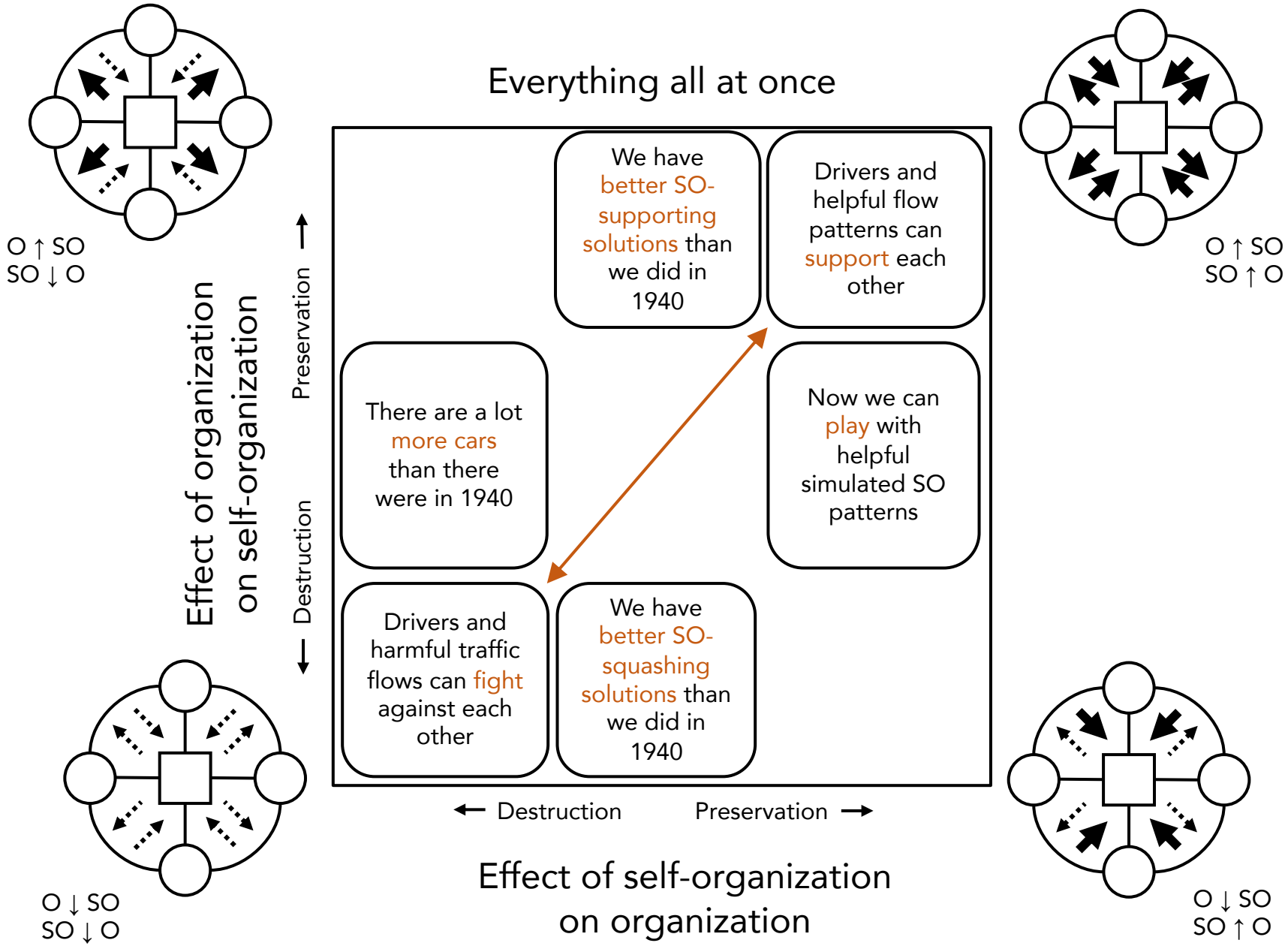
← Destruction Preservation →

Effect of self-organization on organization

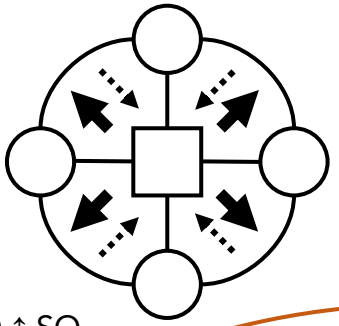


O ↓ SO
SO ↑ O

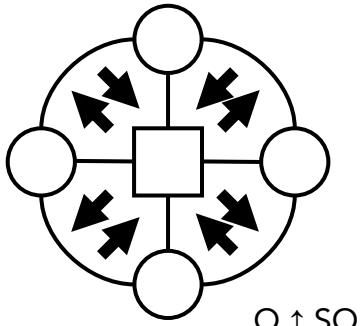

Everything all at once
We have better SO-supporting solutions than we did in 1940
There are a lot more cars than there were in 1940
Now we can play with helpful simulated SO patterns
We have better SO-squashing solutions than we did in 1940
Effect of organization on self-organization
Preservation
Destruction
Destruction
Preservation
Effect of self-organization on organization
O ↑ SO
SO ↓ O
O ↑ SO
SO ↑ O
O ↓ SO
SO ↓ O
O ↓ SO
SO ↑ O


Everything all at once
We have better SO-supporting solutions than we did in 1940
Drivers and helpful flow patterns can support each other
There are a lot more cars than there were in 1940
Now we can play with helpful simulated SO patterns
Drivers and harmful traffic flows can fight against each other
We have better SO-squashing solutions than we did in 1940
Effect of organization on self-organization
Preservation
Destruction
Destruction
Preservation
Effect of self-organization on organization
O ↑ SO
SO ↓ O
O ↑ SO
SO ↑ O
O ↓ SO
SO ↓ O
O ↓ SO
SO ↑ O

Everything all at once



O ↑ SO
SO ↓ O



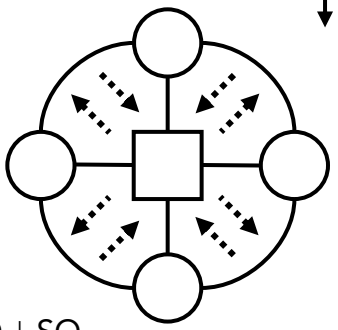
O ↑ SO
SO ↑ O

Effect of organization on self-organization

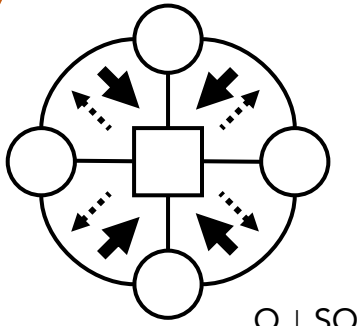
Preservation

Destruction

A bad road design can start recurring slowdowns it cannot stop	We have better SO-supporting solutions than we did in 1940	Drivers and helpful flow patterns can support each other
There are a lot more cars than there were in 1940		Now we can play with helpful simulated SO patterns
Drivers and harmful traffic flows can fight against each other	We have better SO-squashing solutions than we did in 1940	A blind, brute-force redesign could destroy invisibly useful SO patterns



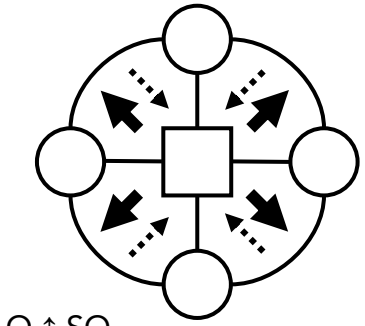
O ↓ SO
SO ↓ O



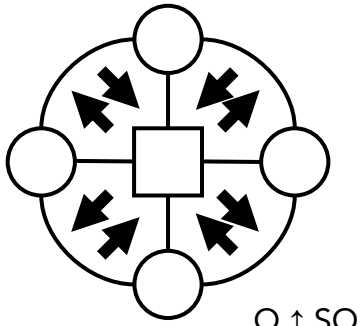
O ↓ SO
SO ↑ O

← Destruction Preservation →

Effect of self-organization on organization



O ↑ SO
SO ↓ O



O ↑ SO
SO ↑ O

Everything all at once

A bad road design can start recurring slowdowns it cannot stop	We have better SO-supporting solutions than we did in 1940	Drivers and helpful flow patterns can support each other
There are a lot more cars than there were in 1940	Find ways to help without harm with small experiments	Now we can play with helpful simulated SO patterns
Drivers and harmful traffic flows can fight against each other	We have better SO-squashing solutions than we did in 1940	A blind, brute-force redesign could destroy invisibly useful SO patterns

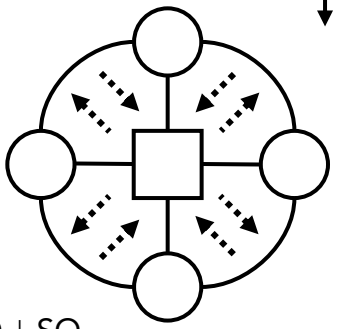
Effect of organization on self-organization

Preservation ↑

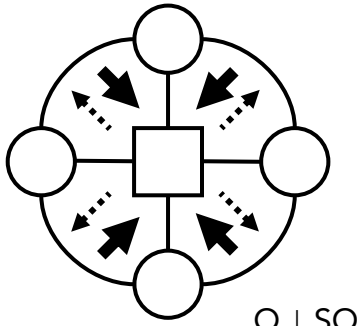
Destruction ↓

← Destruction Preservation →

Effect of self-organization on organization

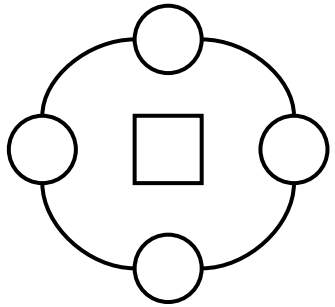


O ↓ SO
SO ↓ O

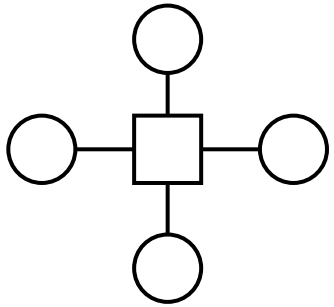


O ↓ SO
SO ↑ O

The Connecting-the-dots Thinking Space



Real self-organized pattern



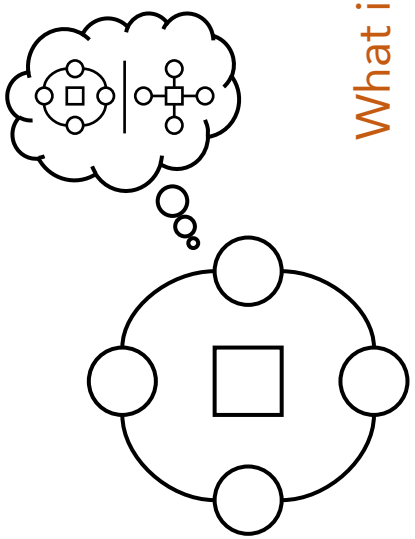
Real organized plan

What is real?

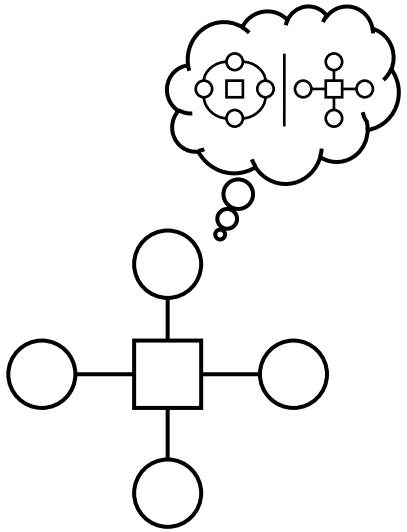
Something

Not sure

Something else



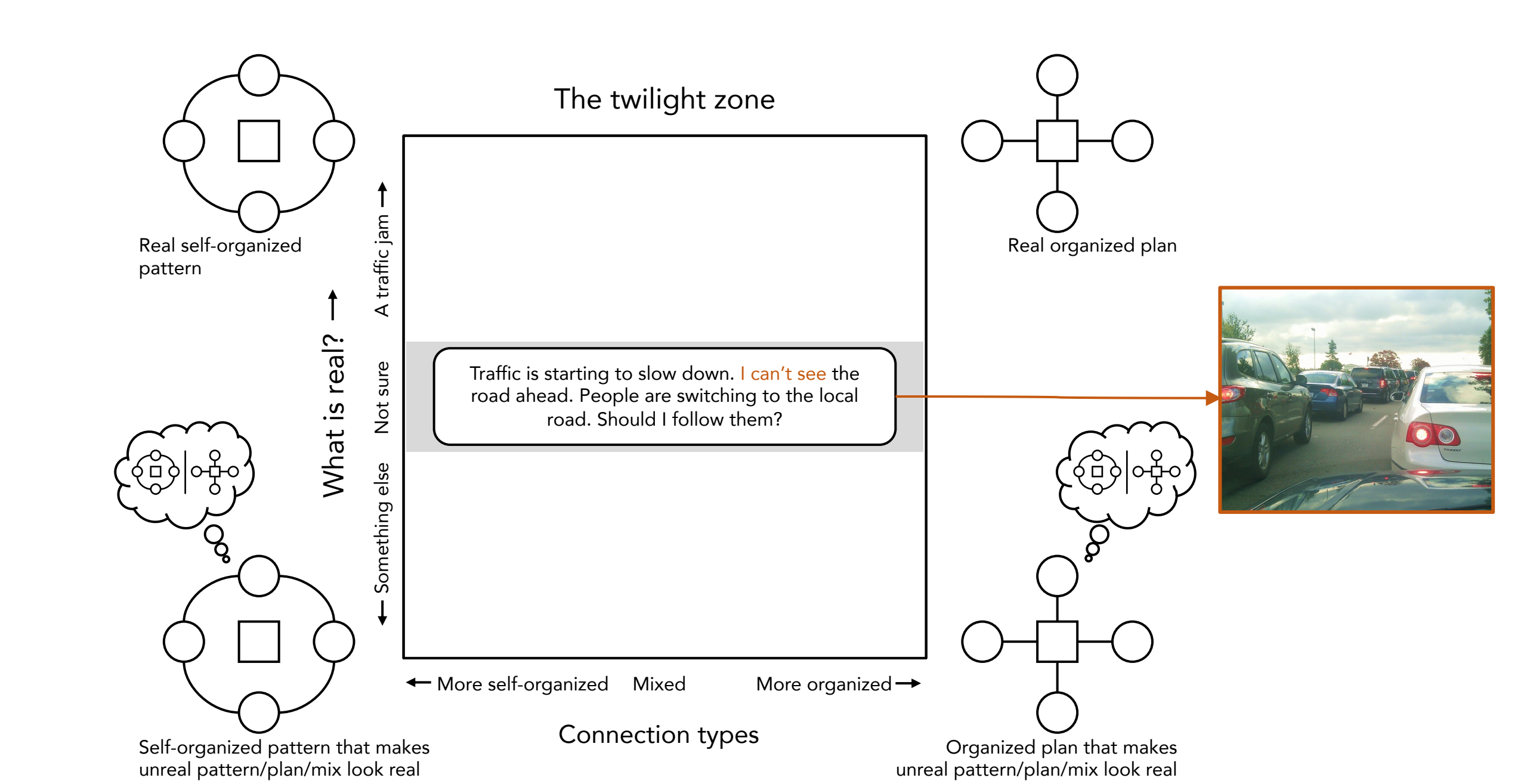
Self-organized pattern that makes unreal pattern/plan/mix look real

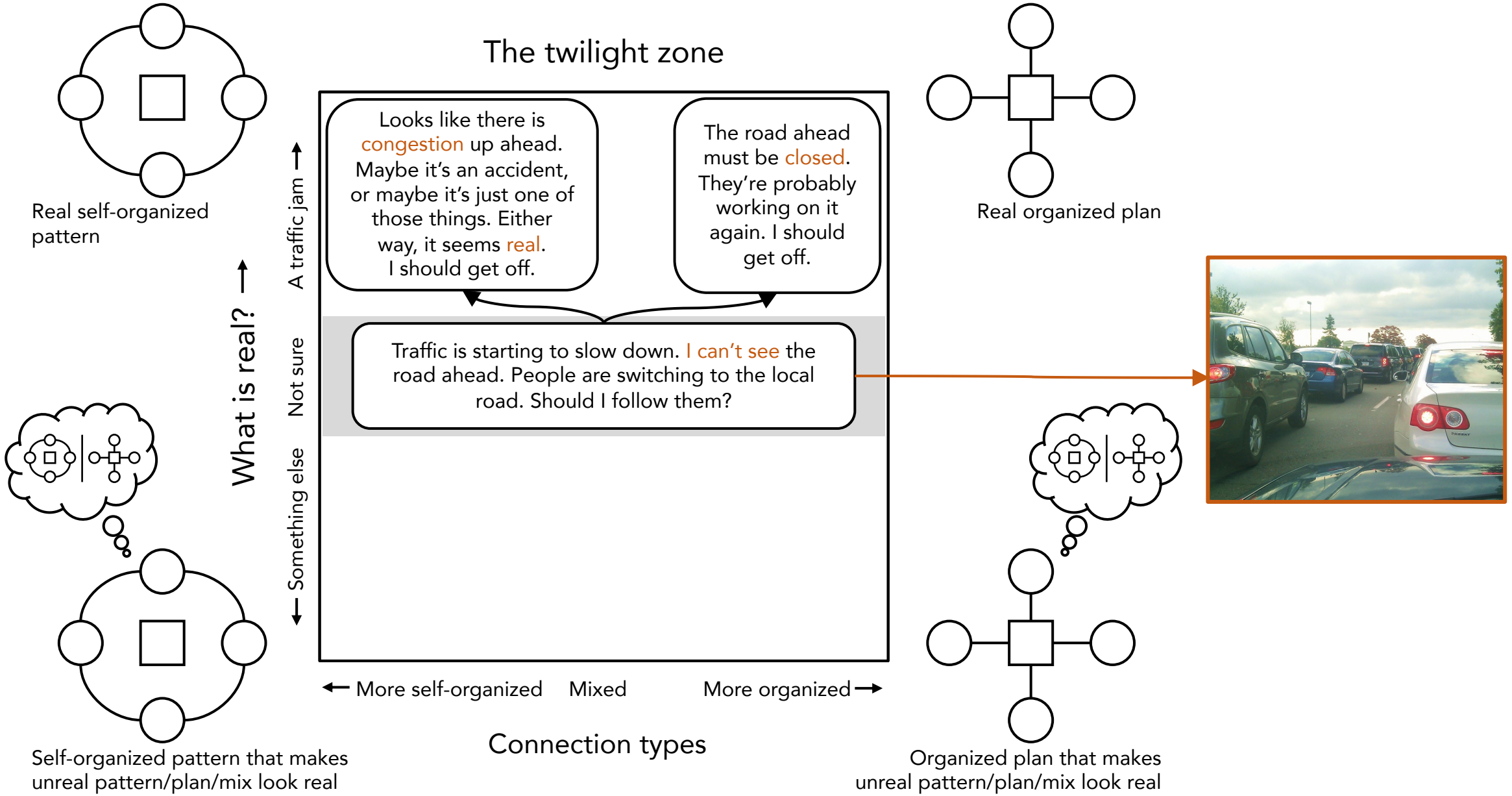


Organized plan that makes unreal pattern/plan/mix look real

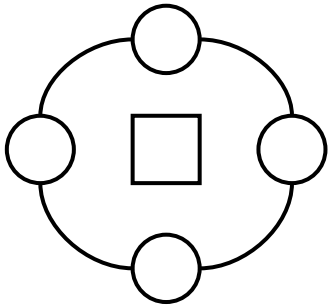
← More self-organized Mixed More organized →

Connection types

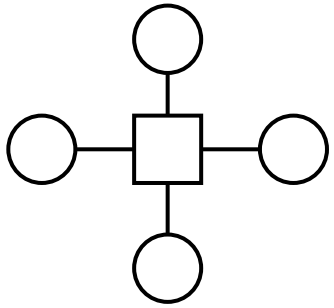

The twilight zone
Real self-organized pattern
Real organized plan
What is real?
A traffic jam
Not sure
Something else
Traffic is starting to slow down. I can't see the road ahead. People are switching to the local road. Should I follow them?
More self-organized
Mixed
More organized
Connection types
Self-organized pattern that makes unreal pattern/plan/mix look real
Organized plan that makes unreal pattern/plan/mix look real


The twilight zone
Real self-organized pattern
Real organized plan
Looks like there is congestion up ahead. Maybe it's an accident, or maybe it's just one of those things. Either way, it seems real. I should get off.
The road ahead must be closed. They're probably working on it again. I should get off.
Traffic is starting to slow down. I can't see the road ahead. People are switching to the local road. Should I follow them?
What is real?
A traffic jam
Not sure
Something else
More self-organized
Mixed
More organized
Connection types
Self-organized pattern that makes unreal pattern/plan/mix look real
Organized plan that makes unreal pattern/plan/mix look real

The twilight zone



Real self-organized pattern



Real organized plan

What is real?

A traffic jam

Looks like there is congestion up ahead. Maybe it's an accident, or maybe it's just one of those things. Either way, it seems real. I should get off.

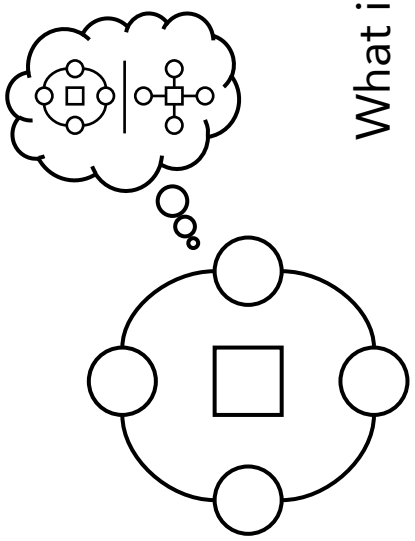
The road ahead must be closed. They're probably working on it again. I should get off.

Not sure

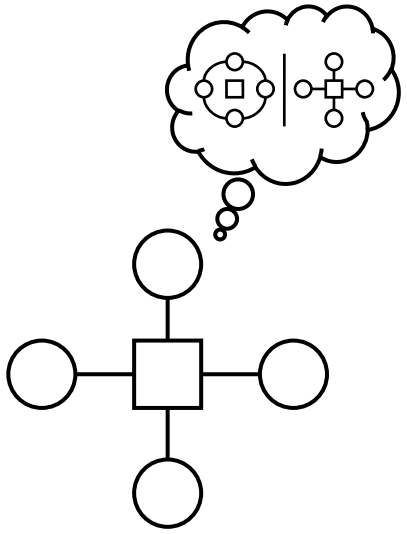
Traffic is starting to slow down. I can't see the road ahead. People are switching to the local road. Should I follow them?

Something else

There's no traffic jam up ahead. These people are confused. I'll stay where I am. This will be over in a minute.



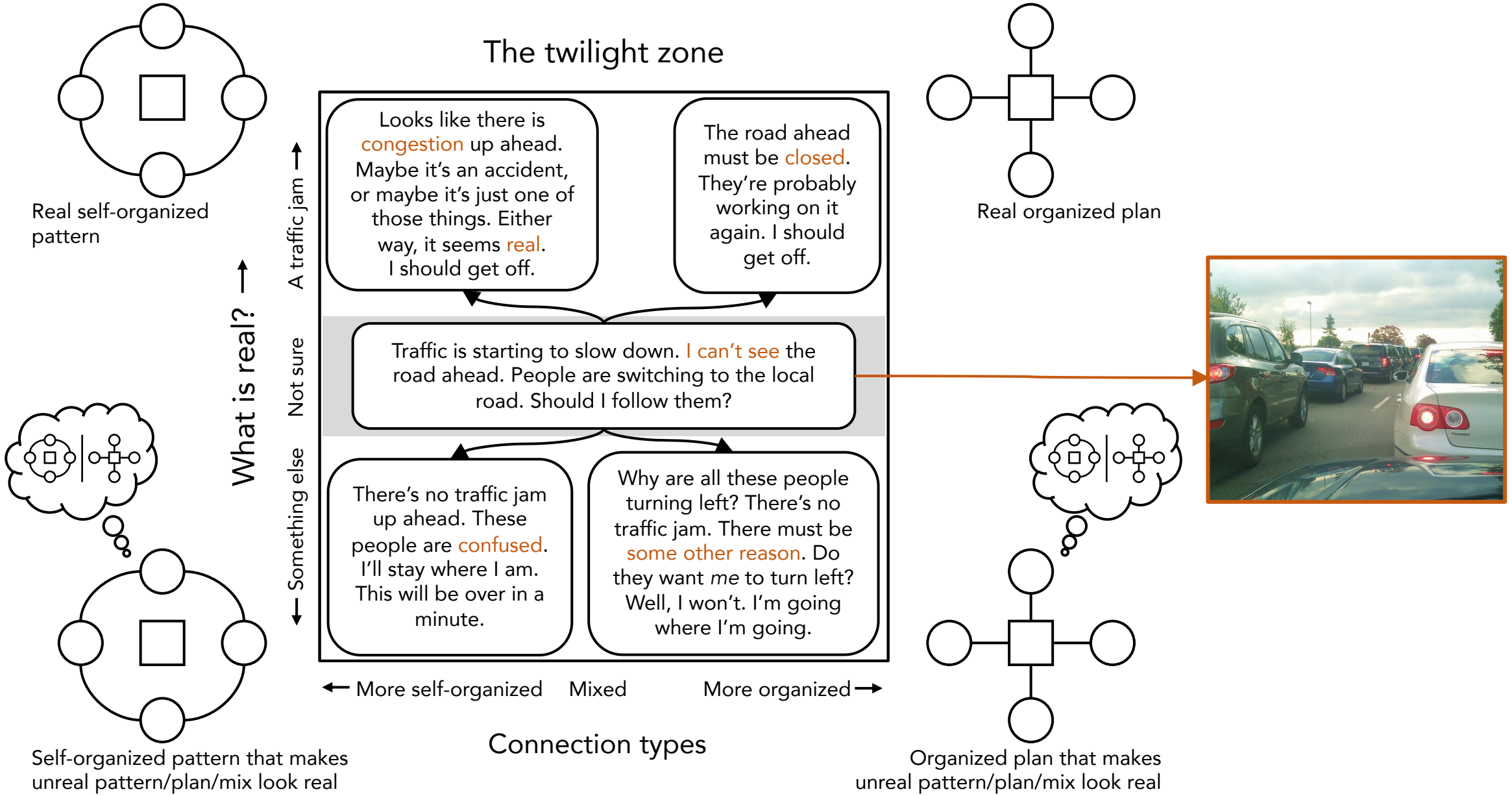
Self-organized pattern that makes unreal pattern/plan/mix look real



Organized plan that makes unreal pattern/plan/mix look real

More self-organized — Mixed — More organized

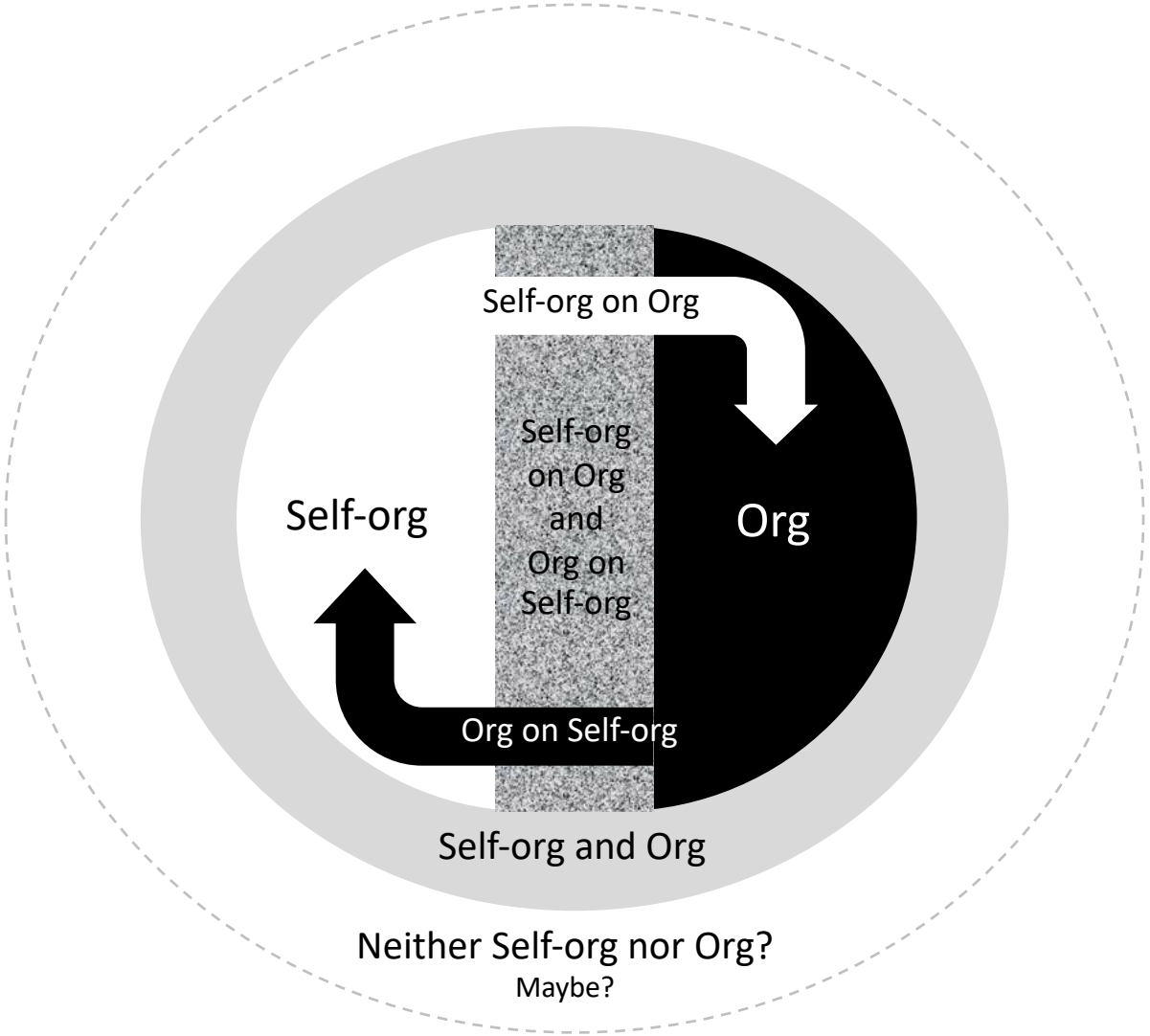
Connection types


The twilight zone
Real self-organized pattern
Real organized plan
Looks like there is congestion up ahead. Maybe it's an accident, or maybe it's just one of those things. Either way, it seems real. I should get off.
The road ahead must be closed. They're probably working on it again. I should get off.
Traffic is starting to slow down. I can't see the road ahead. People are switching to the local road. Should I follow them?
There's no traffic jam up ahead. These people are confused. I'll stay where I am. This will be over in a minute.
Why are all these people turning left? There's no traffic jam. There must be some other reason. Do they want me to turn left? Well, I won't. I'm going where I'm going.
What is real?
A traffic jam
Not sure
Something else
More self-organized
Mixed
More organized
Connection types
Self-organized pattern that makes unreal pattern/plan/mix look real
Organized plan that makes unreal pattern/plan/mix look real

There are seven thinking spaces in the *Confluence* toolset. Each space supports a different situational awareness goal. Choose a space that matches what you want to think about.

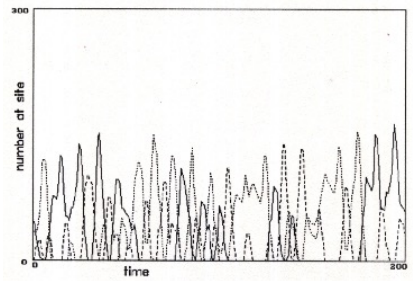
1. Self-org and Org – Confluence
2. Only Self-org – The Jungle
3. Only Org – The Plan
4. How Self-org pushes on Org – Inundation
5. How Org pushes on Self-org – Regulation
6. How Self-org and Org push on each other – The Mix
7. How Self-org and Org might be unclear or disputed – Connecting the Dots

You can use the same group exercise with any or all of the spaces.

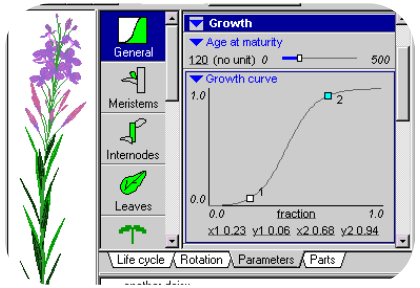


Where did *Confluence* come from? More than three decades of thinking, reading, and experimenting, on my own and in collaboration and discussion with lots of people.

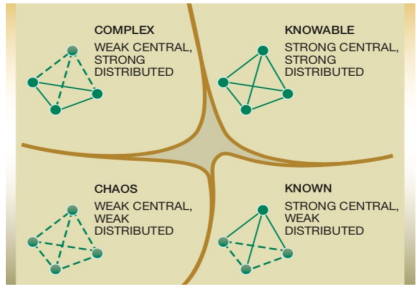
Late 80s | 90s | 00s | 10s | today



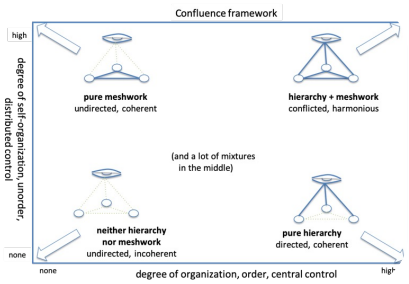
Started out studying ecology and animal behavior; did graduate research on how self-organization interacts with decision making in animal groups



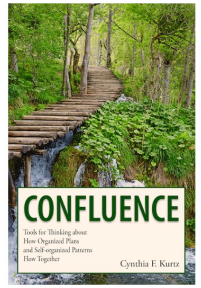
Wandered into writing educational software, then into studying organizational narrative, still thinking about self-organization and decision making



Drew first "seeing eye" diagrams while working with Dave Snowden on Cynefin framework; for some years the two versions lived side-by-side; developed group exercise with Dave and Sharon Darwent



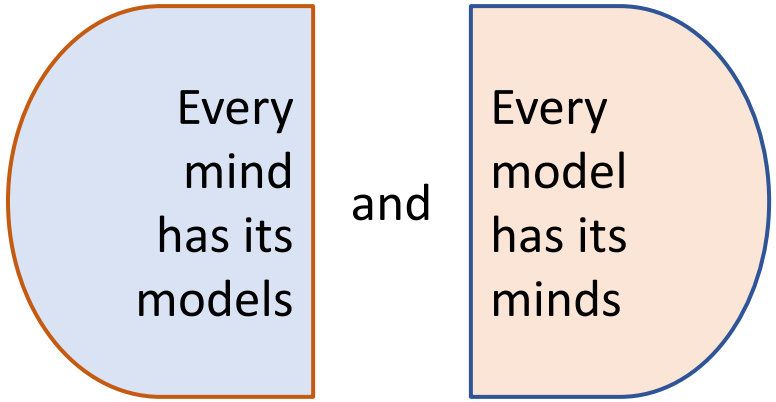
Decided to call my version of Cynefin Confluence; also added 4 more spaces



Improved diagrams and dimensions, added 2 more spaces, wrote *Confluence* book

All of these 24 cousins have something in common with the Confluence toolset. They are all worth looking at.

The American Indian Medicine Wheel
The Chinese Five Elements
The Tipu Ake ki te Ora Maori Organic Leadership model
The Yin-Yang symbol
Jurgen Appelo's simplicity model
Robert Freed Bales' dimensions of social interaction
Stafford Beer's Viable Systems Model
Manuel de Landa's concepts of hierarchy and meshwork
Emery and Trist's Causal Textures model
Dan Epp's Relational Paradigm
Tom Graves' Context-Space Mapping
Dee Hock's writings on Chaordic systems
Luc Hoebeke's Work Systems Model
Claes Janssen's Four Rooms of Change model
Iain McGilchrist's writings on right and left-hemisphere perspectives
Will McWhinney's Paths of Change model
Olson and Gorall's Circumplex model of marital and family systems
Sarbo, Farkas, and van Breemen's Knowledge in Formation theory
Herbert Simon's theory of bounded rationality
Dave Snowden's Cynefin framework
Ralph Stacey's Agreement & Certainty Matrix
Strum and Latour's social link model
Harold van Garderen's SenseCanvas
Harrison White's species of identity interaction



For more info about *Confluence*, including book excerpts and printable exercise materials, see
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