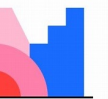


Welcome

AEA: eStudies Series on Systems Thinking

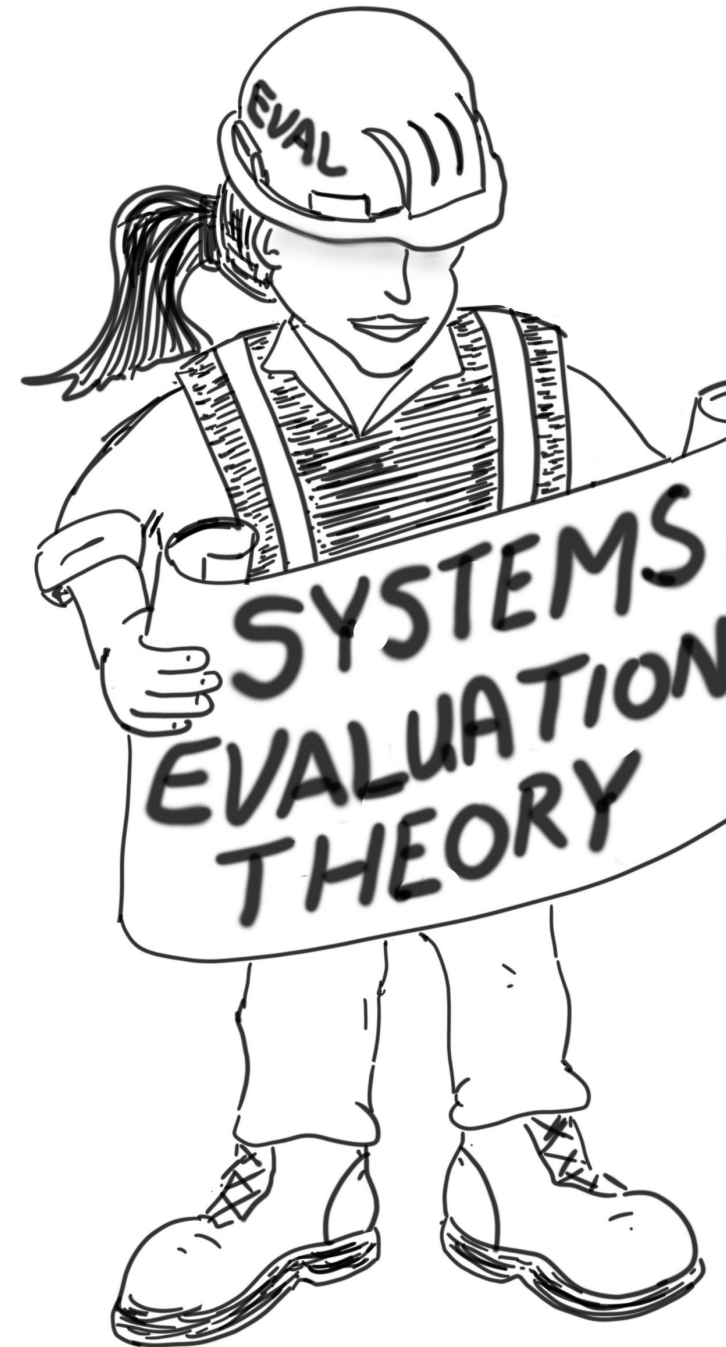


Housekeeping

- AEA:
 - Zack Lambert: education@eval.org
 - Zoom Issues.
 - Accessing PowerPoint slide deck and/or session recording.
- JESS, LLC:
 - Monitoring the chat: Jessica Renger jessica@justevaluation.com
 - Mentimeter issues. Jessica Renger jessica@justevaluation.com
 - Content questions: Ralph Renger ralph@justevaluation.com
- 90-minute session
 - Hopefully break about midway.

Overview of our eStudies Series

- Session 1: Limitations of current evaluation approaches.
 - Systems thinking as a solution for evaluating complex interventions.
- Session 2: Introduction to Systems Evaluation Theory (SET).
 - Step 1: Defining the system (complex intervention).
- Session 3: SET Step 2.
 - Evaluating system interdependence (efficiency).
- Session 4: SET step 3
 - Evaluating system emergence (effectiveness).
 - Evaluating programs using a systems lens.
 - Question Period.



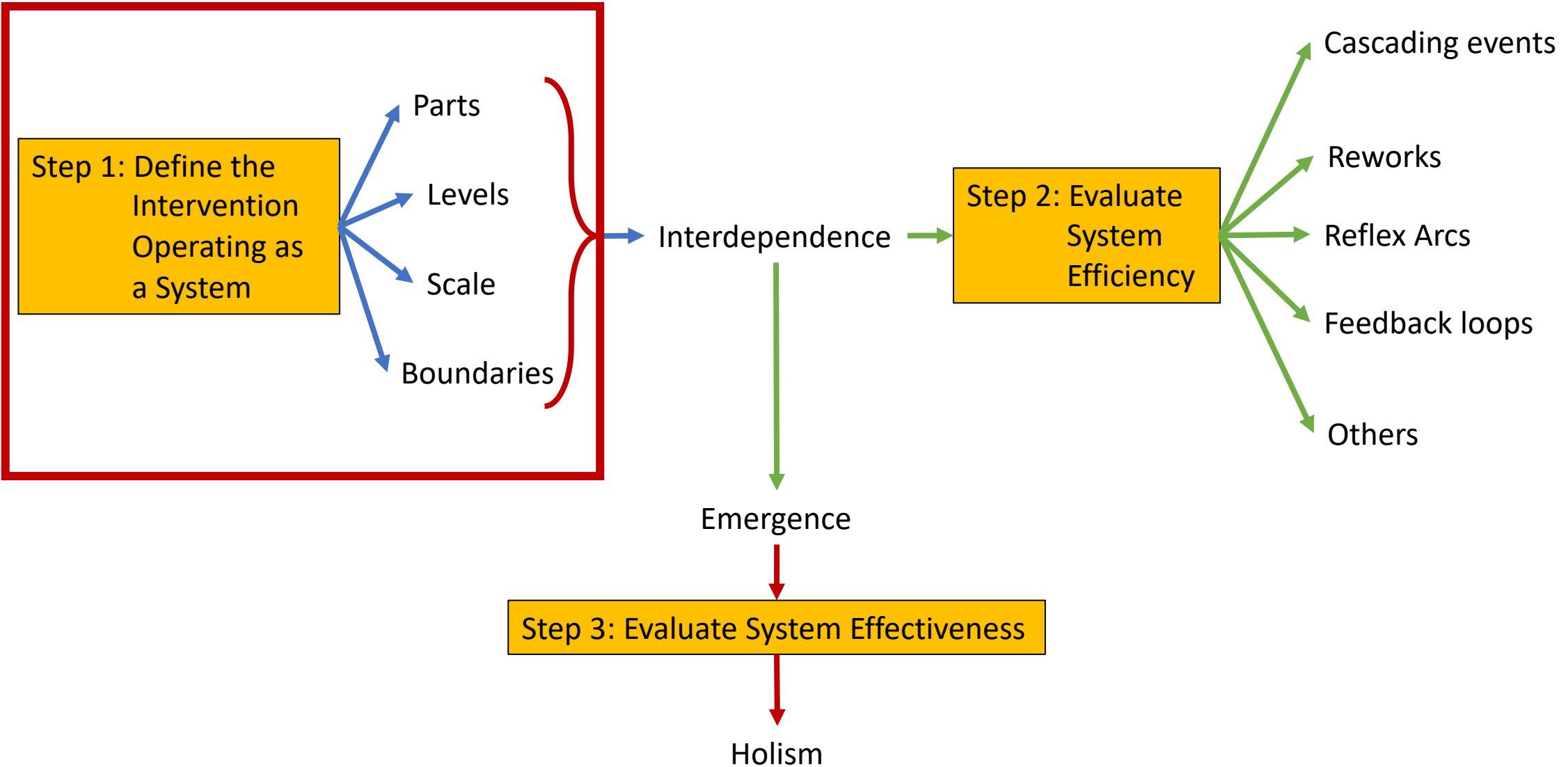
Session 3 Questions

- The book "Fierce Conversations" calls 'reflex arcs' decision trees - pushing out as many decisions to the 'leaves' of the tree that do not need to be reported back on. 'Branches' are decisions that are made and reported back on and 'trunk' decisions are decisions that need to be collaboratively made - Credit to Megan for alerting us to this insightful reference.
- Are SOPs part of a systems map?
 - Yes. The system parts and the SOPs create the system map.
- Do you create “nested” diagram of feedback loops?
 - Yes, if that’s the level of detail needed.
- Can just some of the steps in SET be used?
 - Yes, in the pandemic response I just used system principles in step 2 to provide feedback. I was able to do this because key pieces of workflow were available.
- What if they don’t implement a recommendation?
 - Although over 80% of recommendations are adopted, it is true some are not. The client may have additional insights/perspectives. EUM helps me understand why. If not, then the system will likely continue to operate with the inefficiency.
- Please comment on open vs closed systems.
 - All the complex interventions I evaluate operate in social systems, which are by definition, open.
 - However, social systems can become closed as we saw in the Pandemic. Entropy. Chaos.
- Why did you have to drive all the rural roads to map GPS? Could you not have used available “big data”, like a T-Mobile coverage map?
 - If secondary data exists, then yes you should use it. The T-Mobile map isn’t accurate to hundreds of feet. Not specific enough.
- How could you connect the one change in the dispatch algorithm to saving lives?
 - I can’t. I misspoke. The number of lives saved were a result of many system changes.

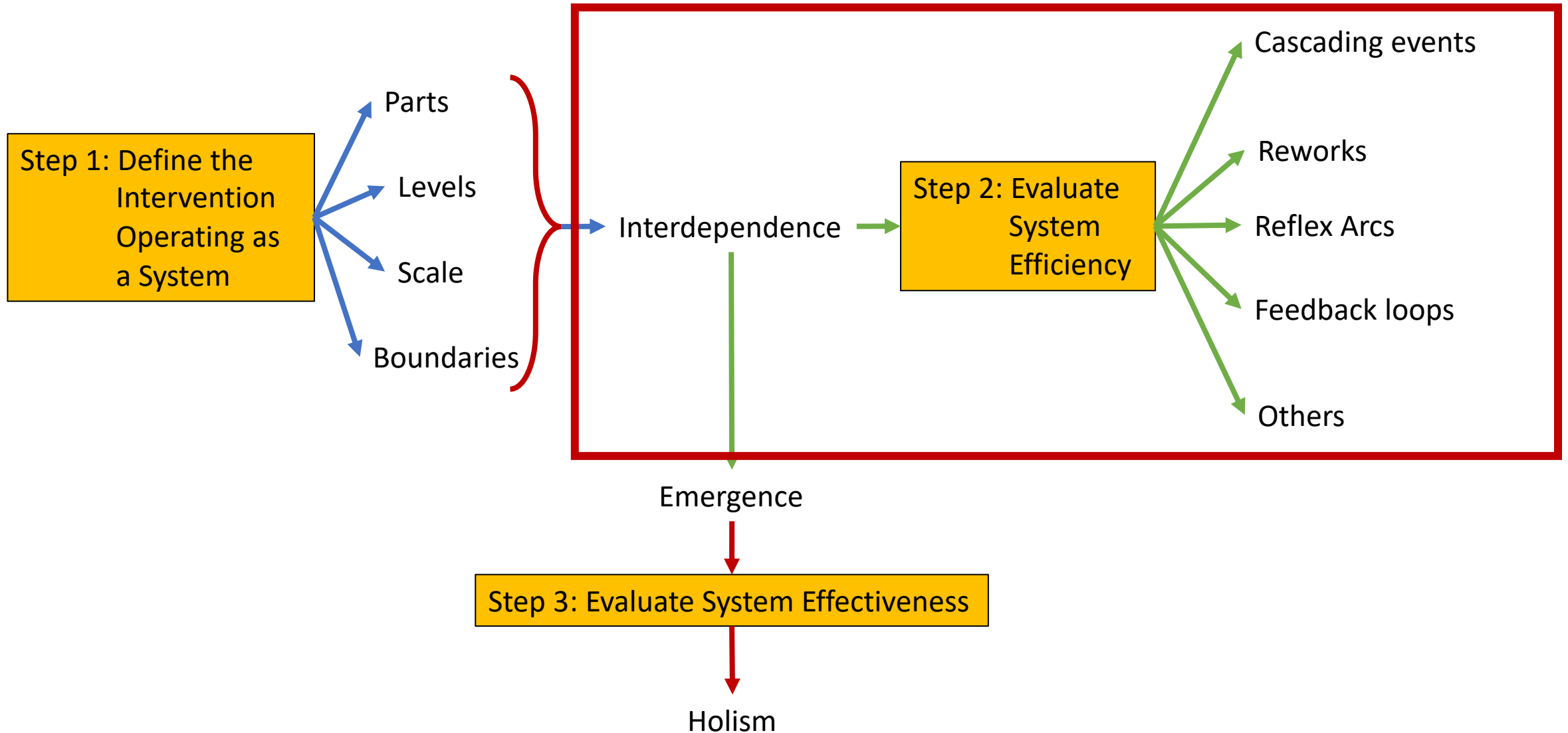


RECAP

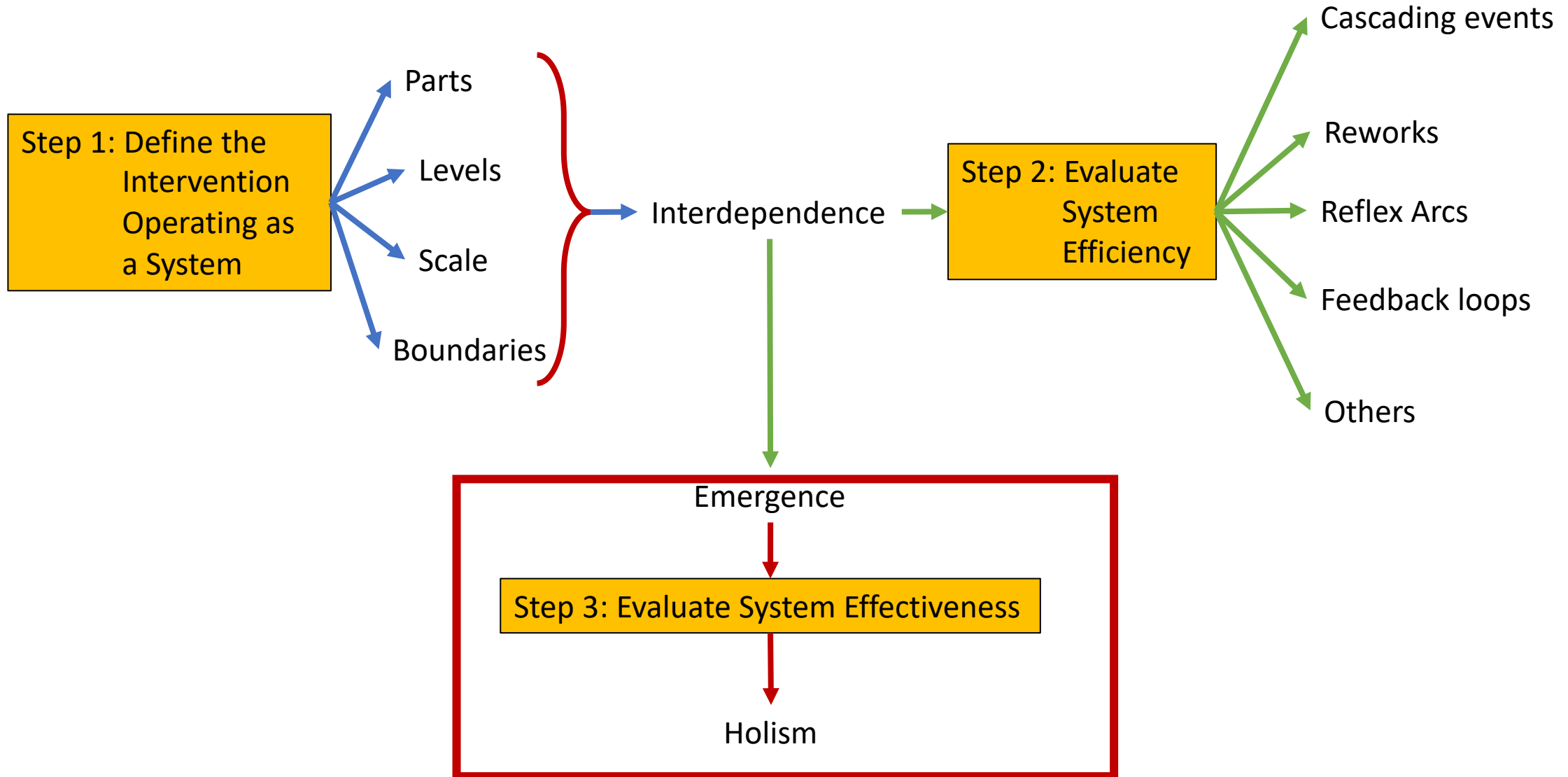
Rationale of Systems Evaluation Theory (SET)



Rationale of Systems Evaluation Theory (SET)



Rationale of Systems Evaluation Theory (SET)

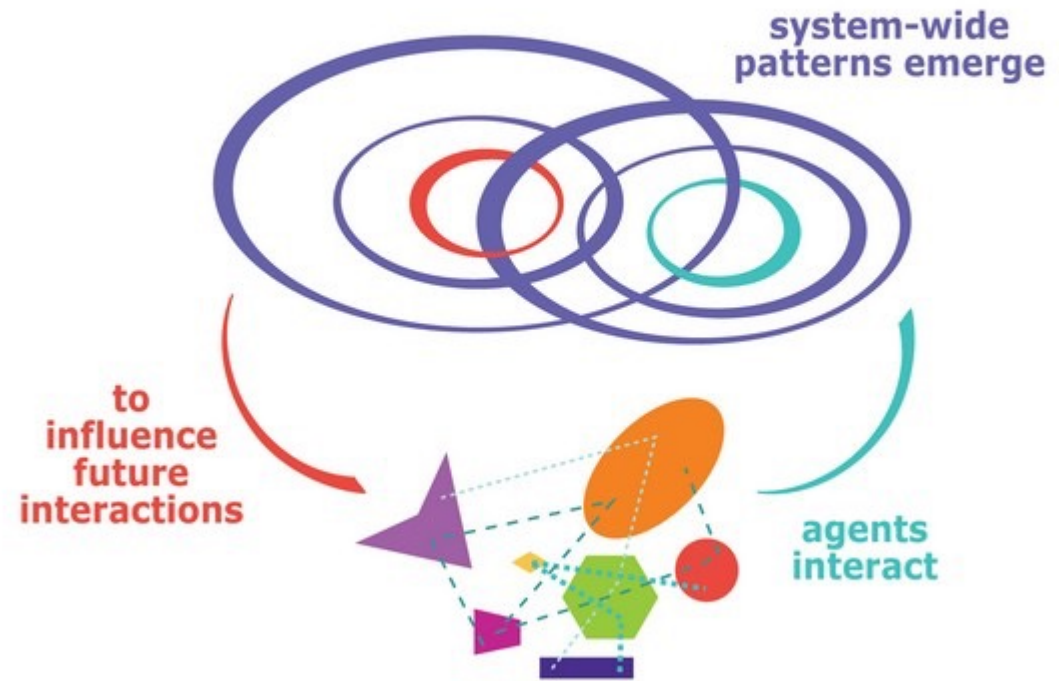




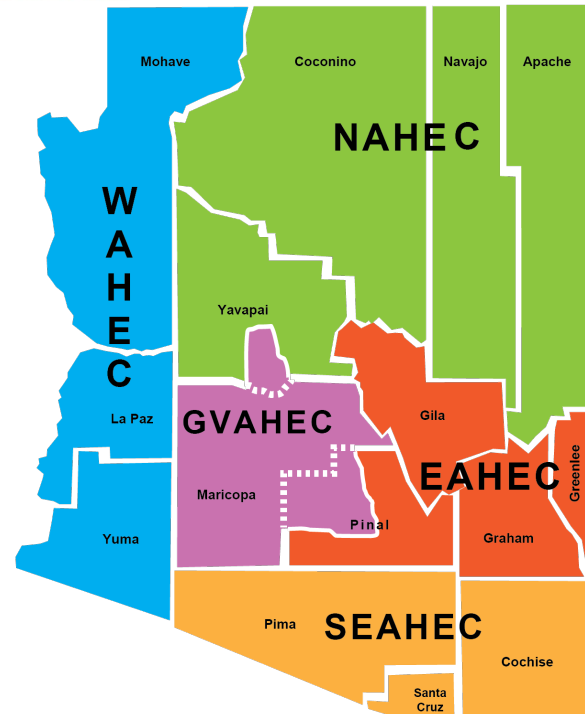
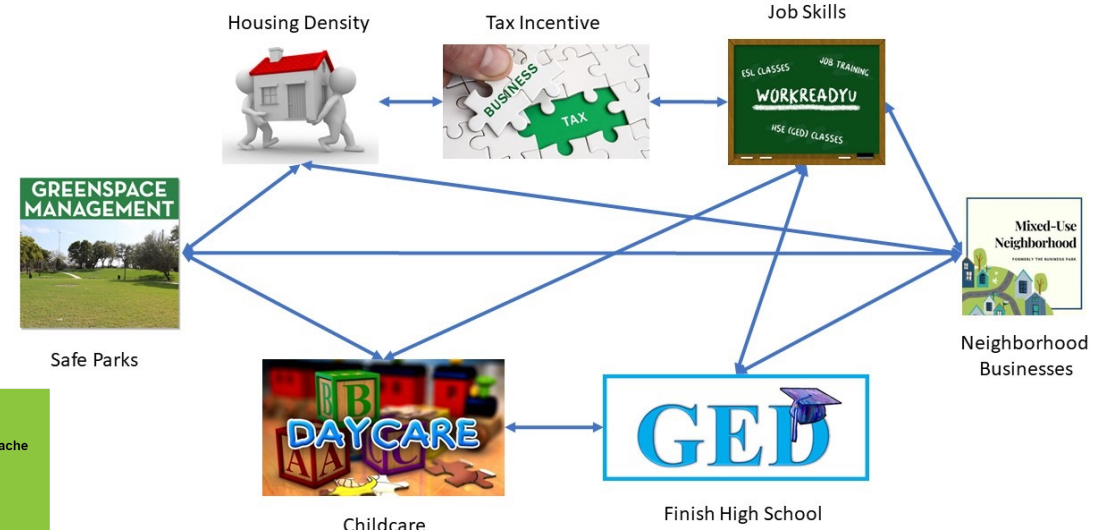
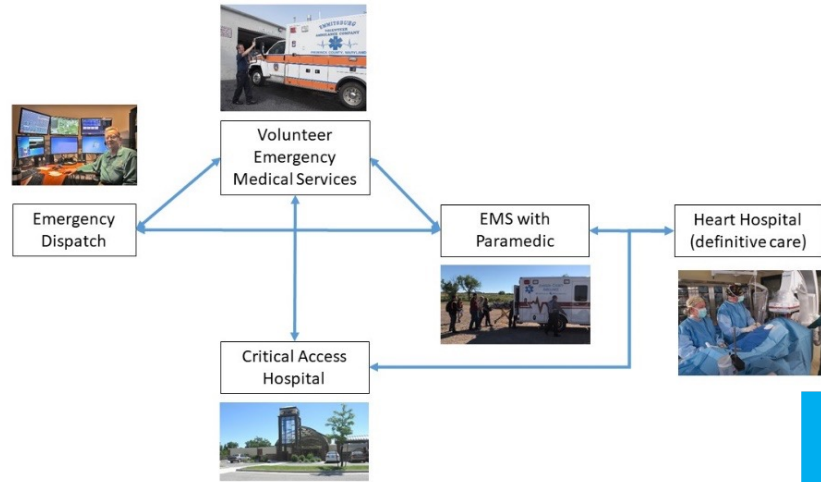
- Objective 1: To understand how to evaluate system emergence (i.e., effectiveness).
- Objective 2: To understand where the responsibility for collecting emergent outcomes lies.
- Objective 3: To understand how a program evaluation differs using a systems lens.

Step 3: Evaluating System Emergence (i.e., effectiveness)

- To evaluate a system's effectiveness is to ask whether the interdependent parts were successful in allowing the essential system property to emerge.



Examples of emergent properties from previous weeks



Volunteer Emergency
Medical Services



Heart Hospital
(definitive care)



Cardiac Care System



Emergency
Dispatch



Critical Access
Hospital



EMS with
Paramedic

Volunteer Emergency
Medical Services



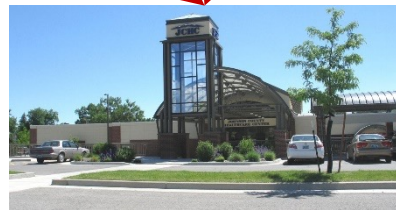
Heart Hospital
(definitive care)



Cardiac Care System



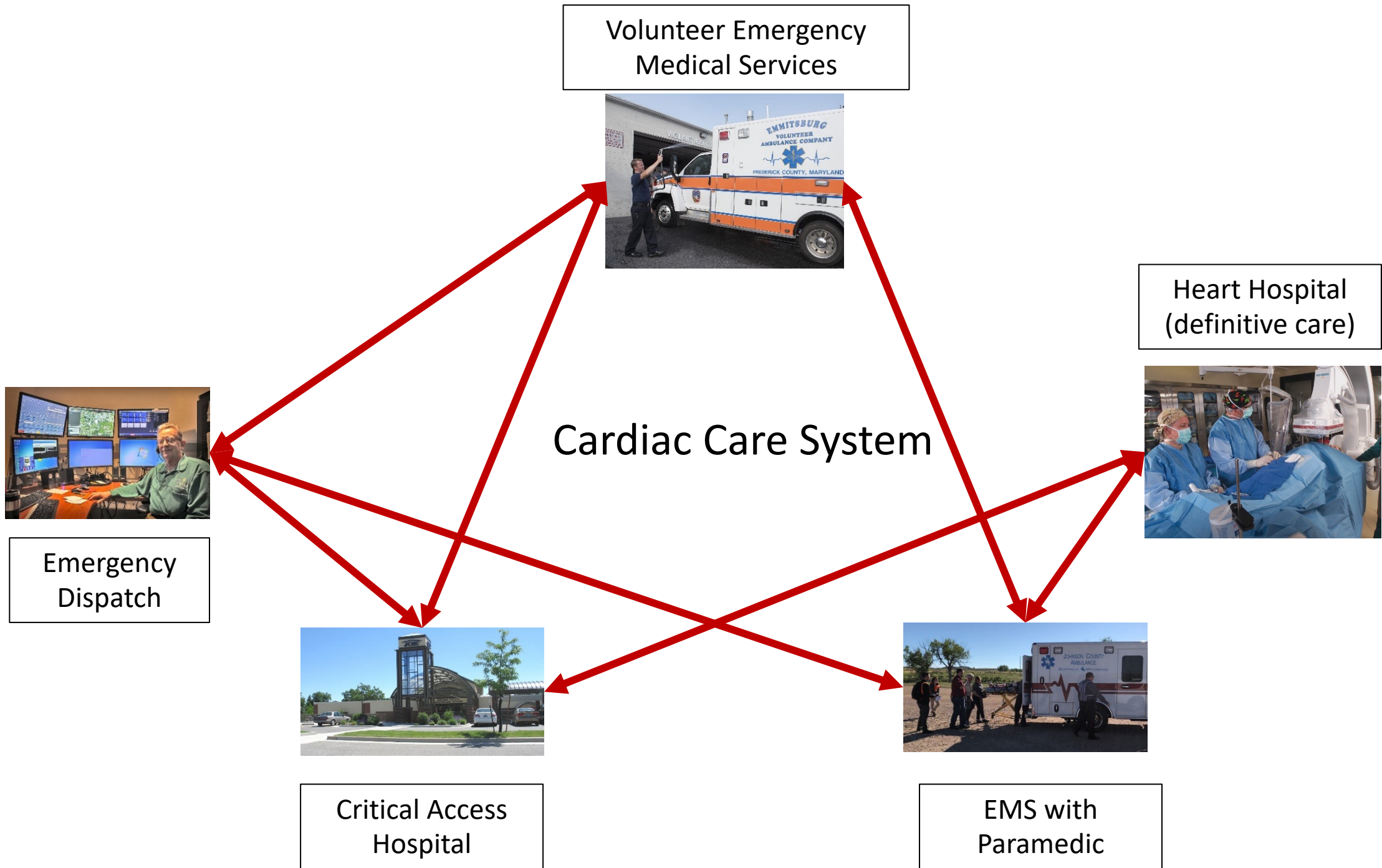
Emergency
Dispatch



Critical Access
Hospital



EMS with
Paramedic



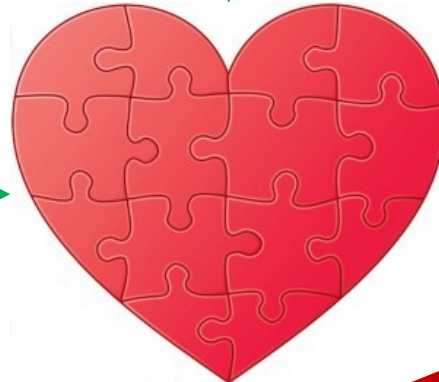
Volunteer Emergency
Medical Services



Heart Hospital
(definitive care)



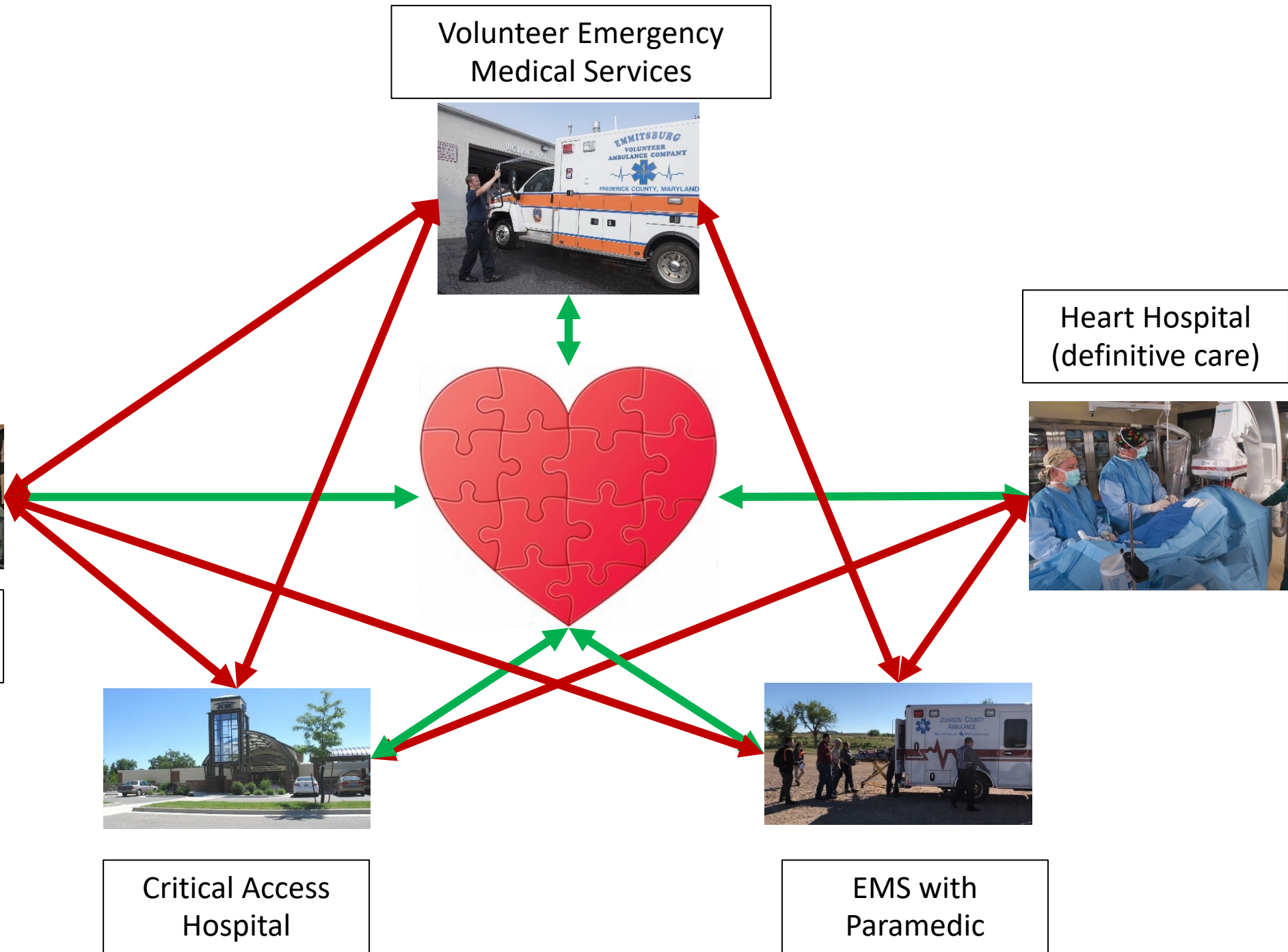
Emergency
Dispatch



Critical Access
Hospital



EMS with
Paramedic



Housing Density



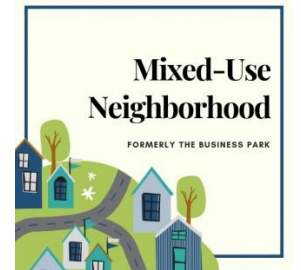
Job Skills



Safe Parks



Neighborhood Businesses



HUD HOPE VI



Childcare



Finish High School

Housing Density



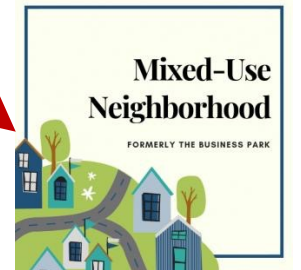
Job Skills



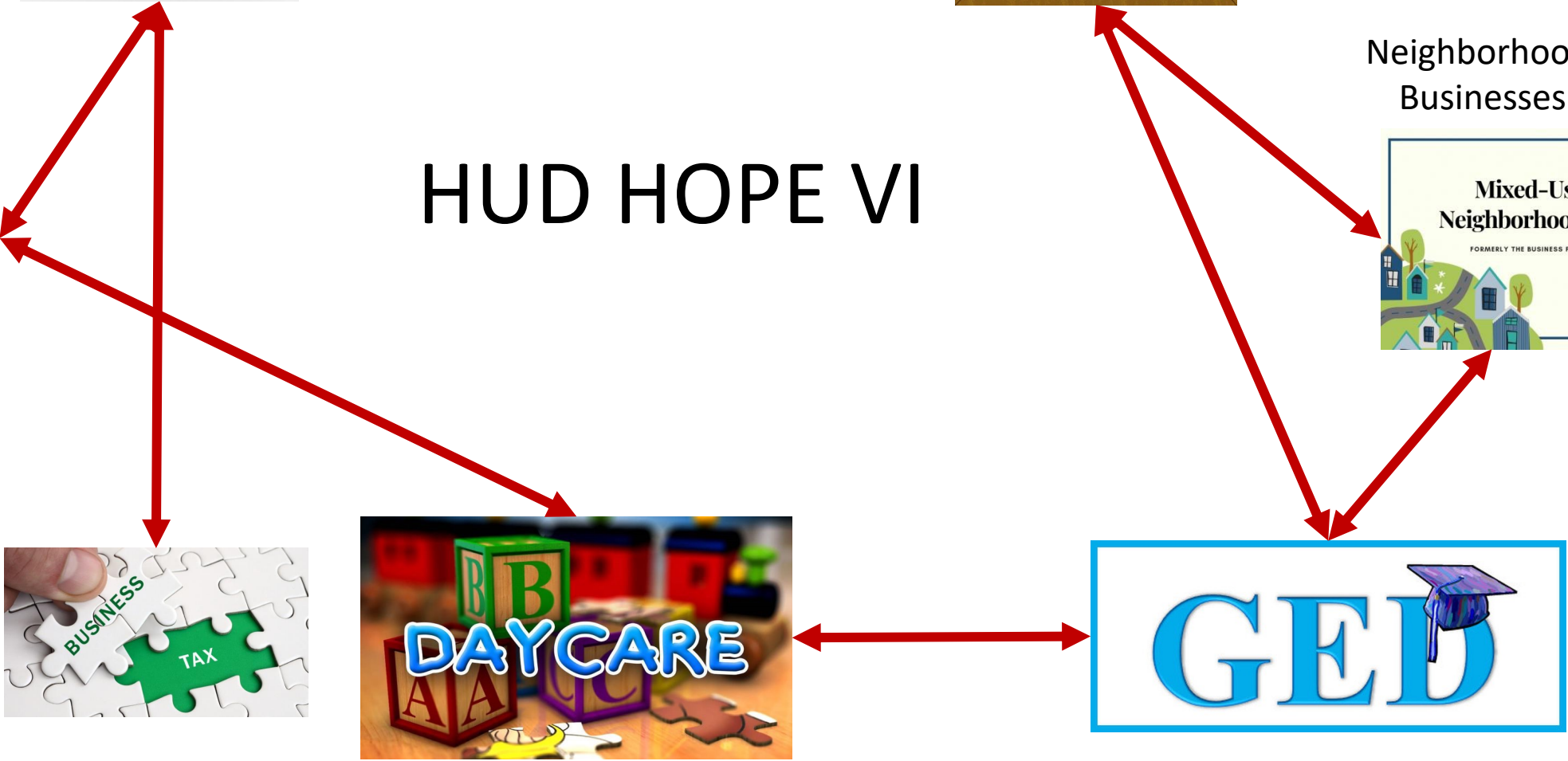
Safe Parks



Neighborhood
Businesses



HUD HOPE VI



Childcare

Finish High School

Housing Density



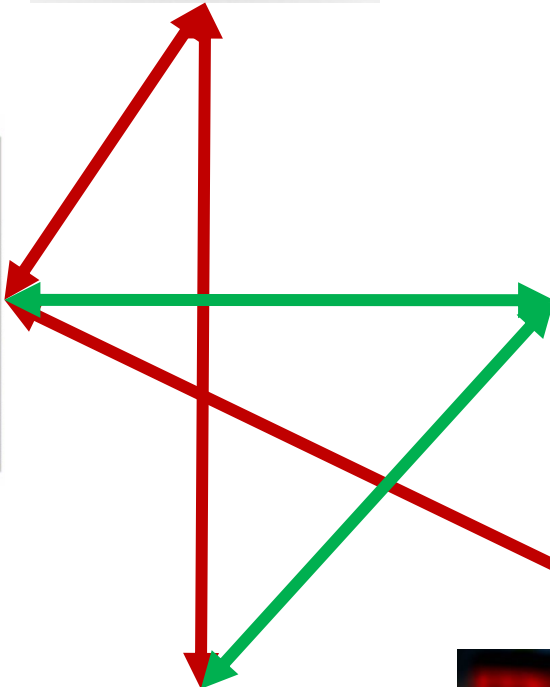
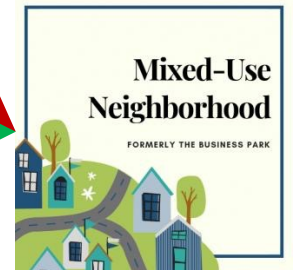
Job Skills



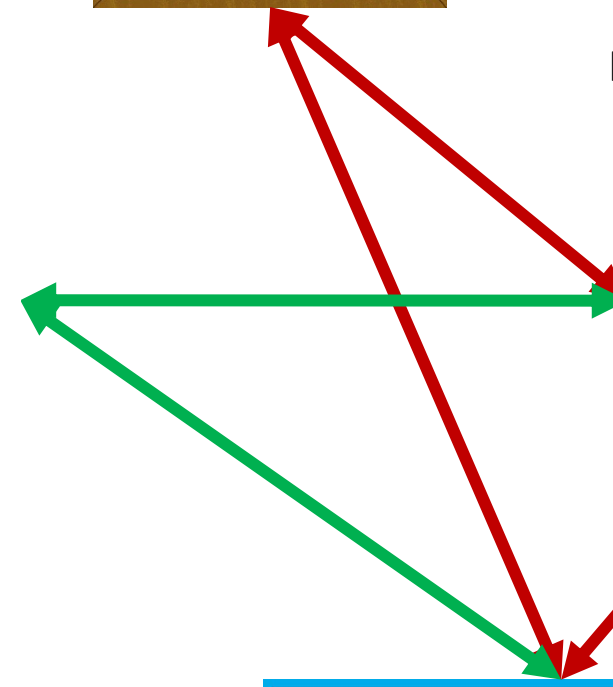
Safe Parks



Neighborhood Businesses



Childcare



Finish High School

Intro courses

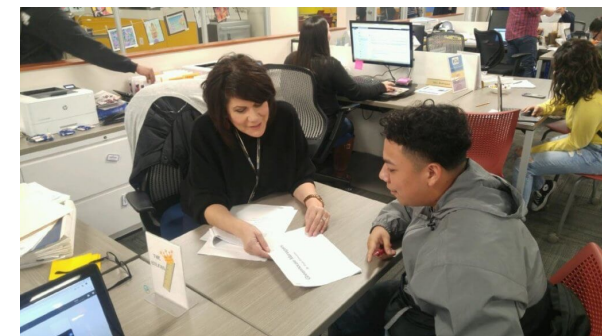
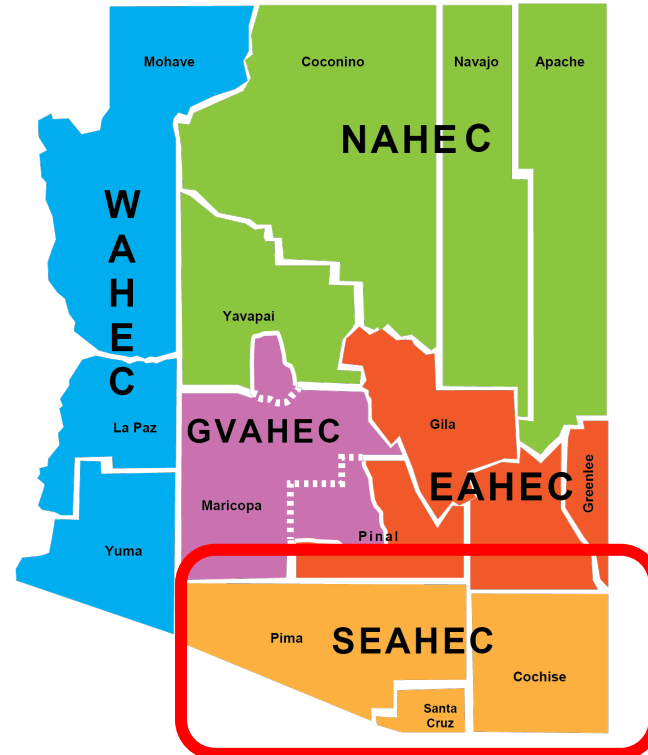


Area Health Education Centers

Field Trips



Guest Speakers

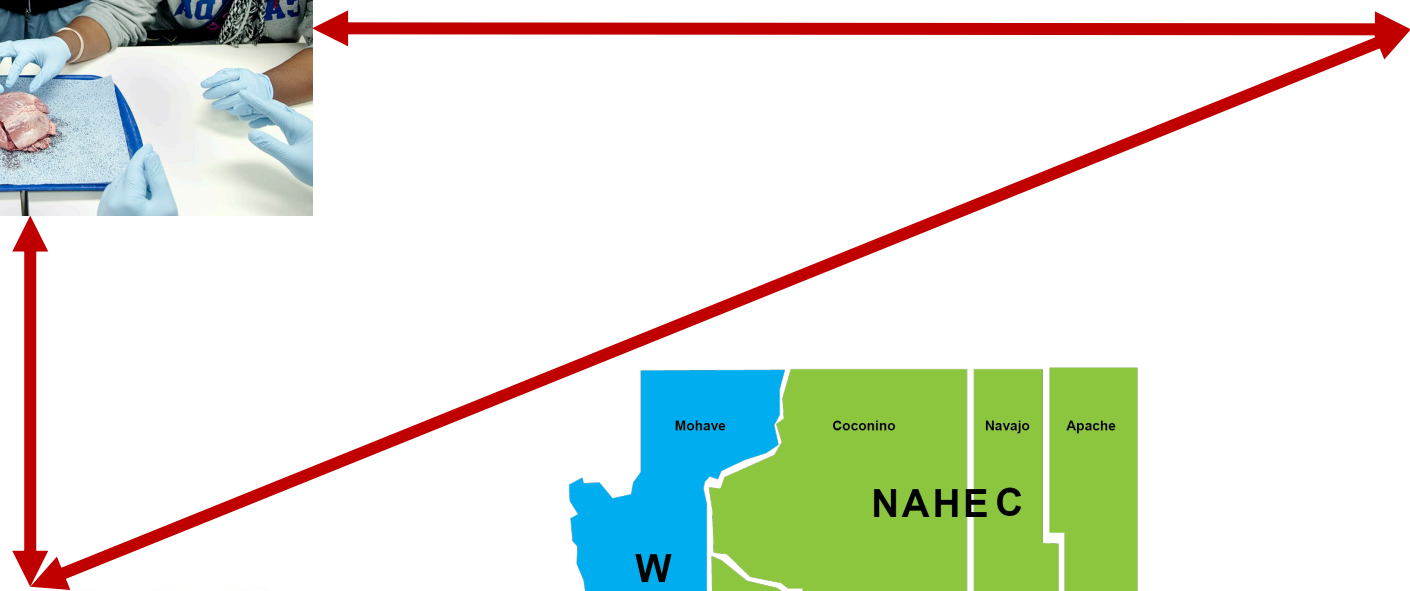


Financial assistance/planning

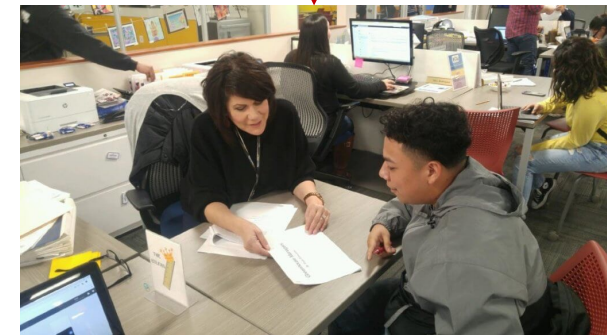
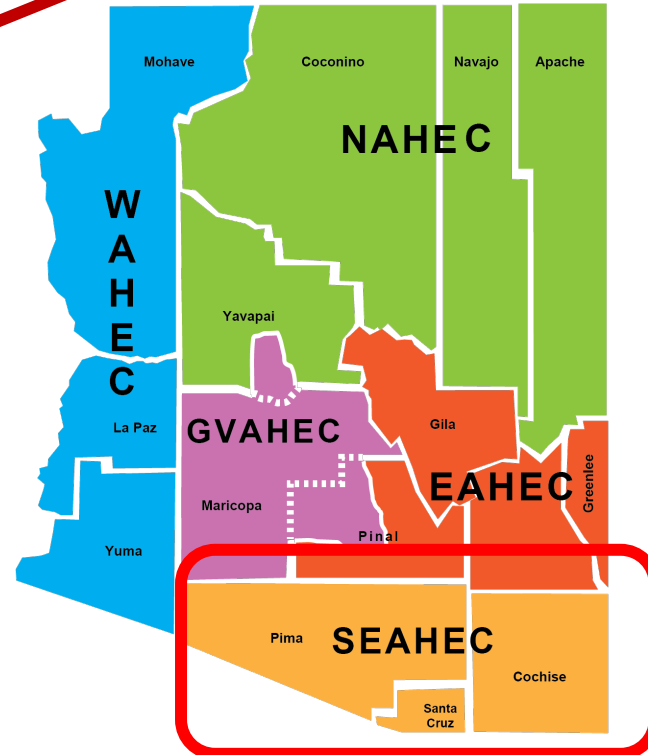
Intro courses



Field Trips



Guest Speakers



Financial assistance/planning

Intro courses



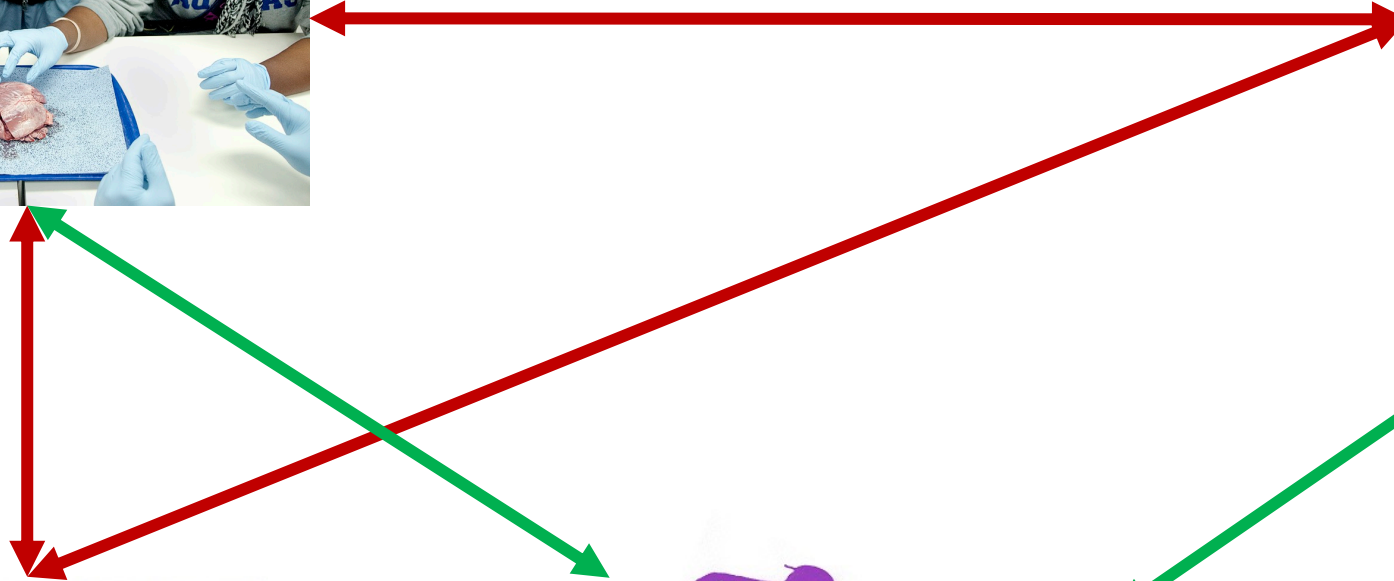
Field Trips



Guest Speakers



Financial assistance/planning



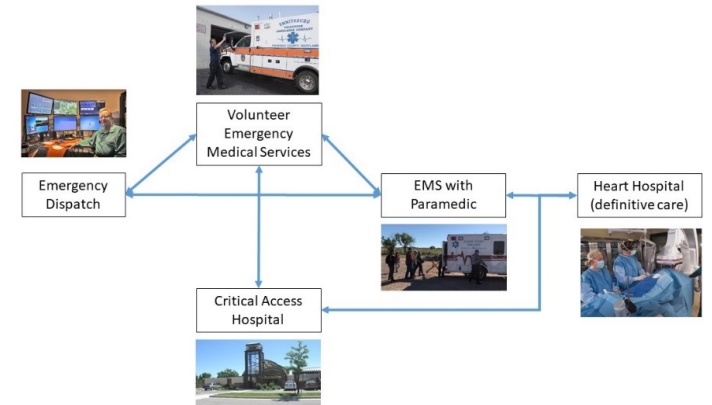
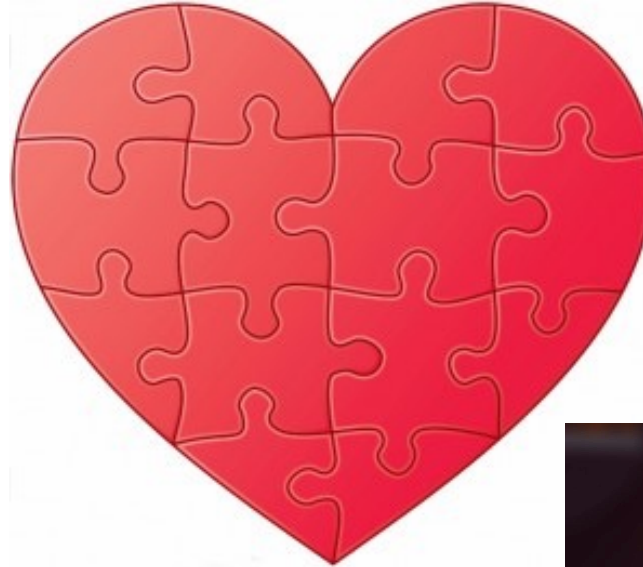
Emergence Strength

- Chalmers (2006)
 - Strong = what you might be able to predict.
 - Weak = what you can't easily predict.
- If property you thought isn't emerging it may mean the system isn't operating efficiently.
- If system is operating efficiently, it may mean you have an unanticipated emergent property.

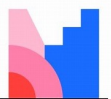


Cardiac Care Emergent Properties

- Strong emergence:
 - Better health outcomes.

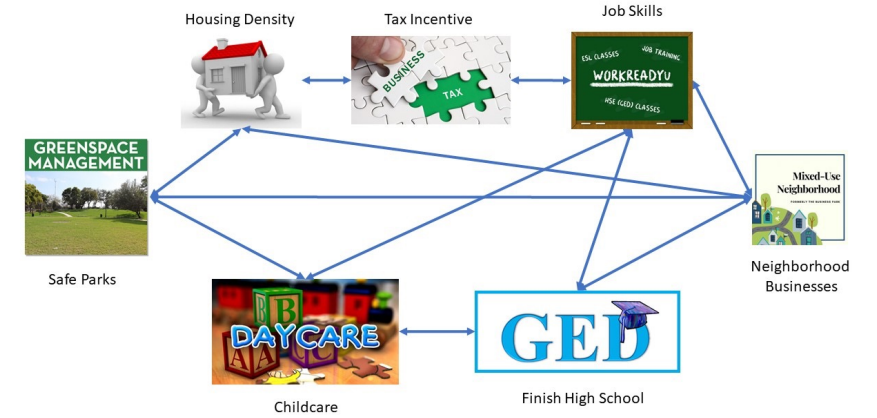
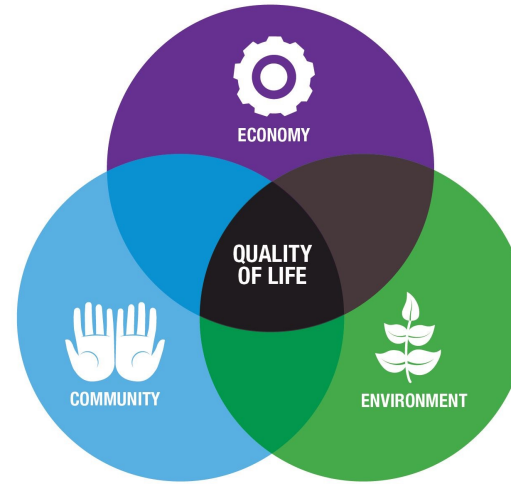


- Weak emergence: Public's faith in the system:
 - Not driving themselves to a heart hospital.

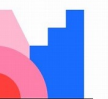
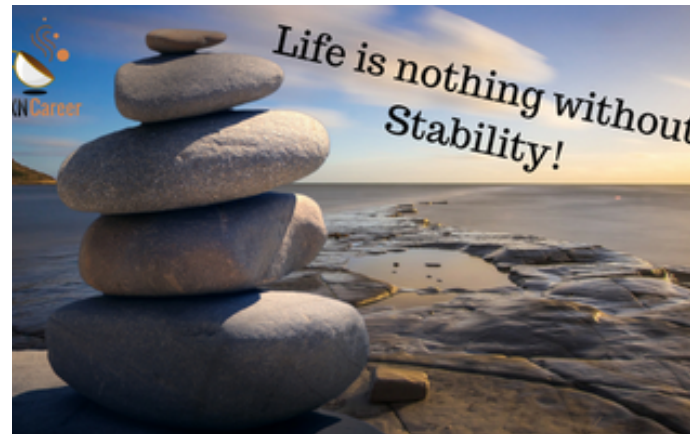


HUD Emergent Properties

- Strong emergence:
 - Quality of Life.

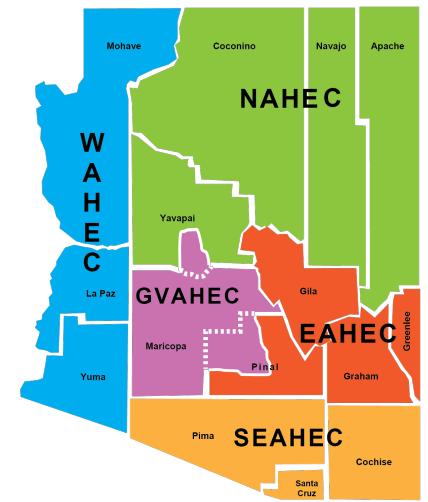
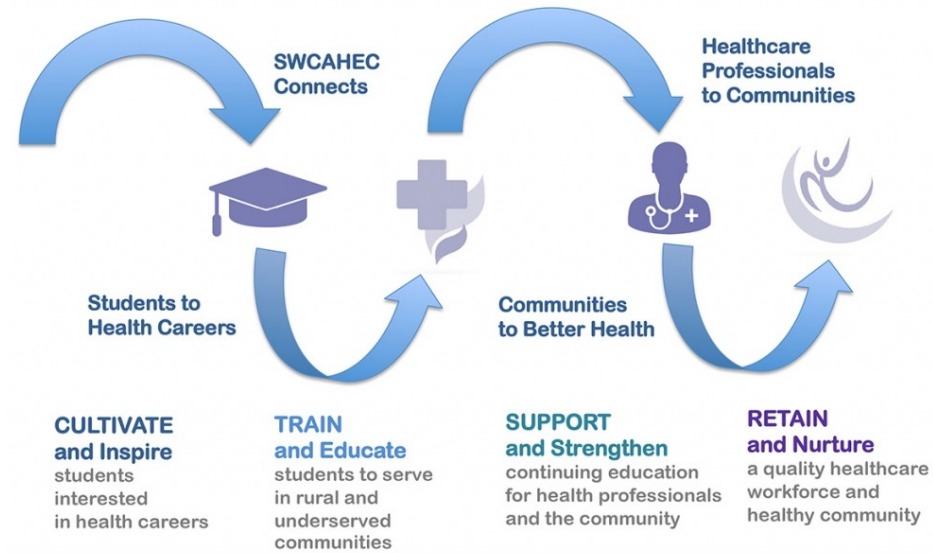


- Weak emergence:
 - Stability.



AHEC Emergent Properties

- Strong emergence:
 - Inspire kids to a health career.

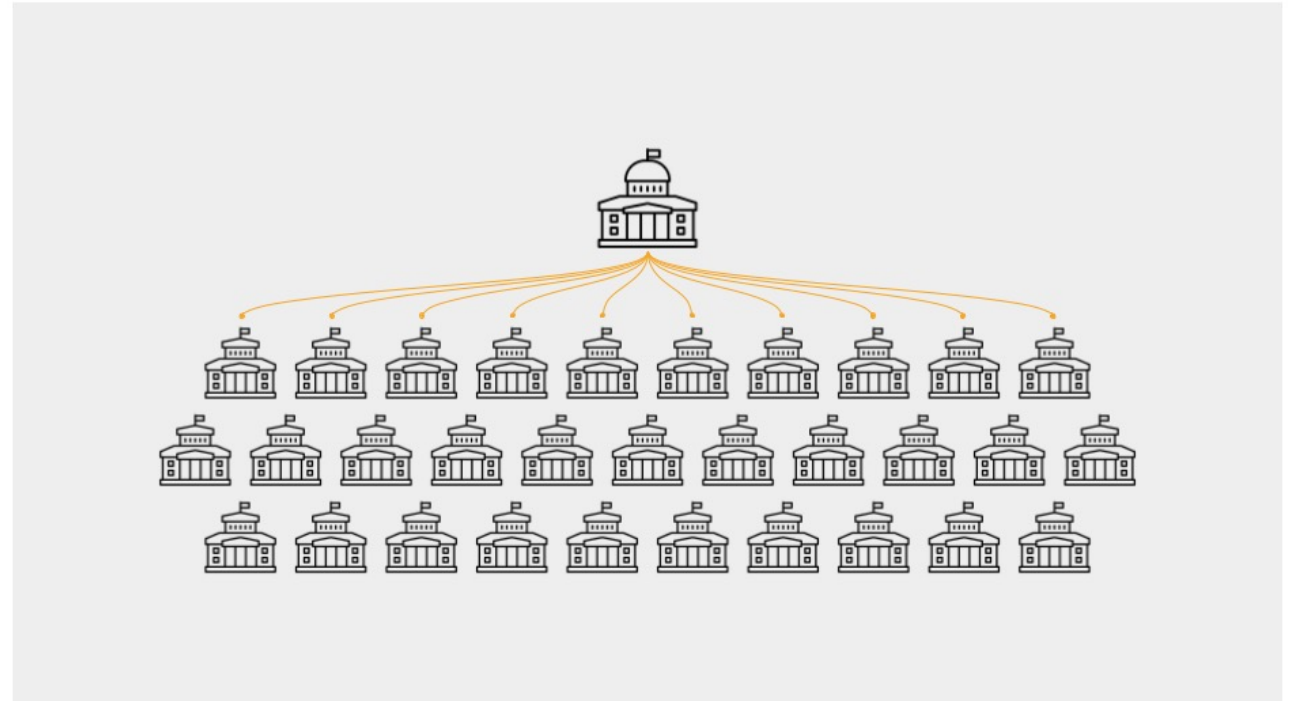


- Weak emergence:
 - Creating human beings interested in the greater good.



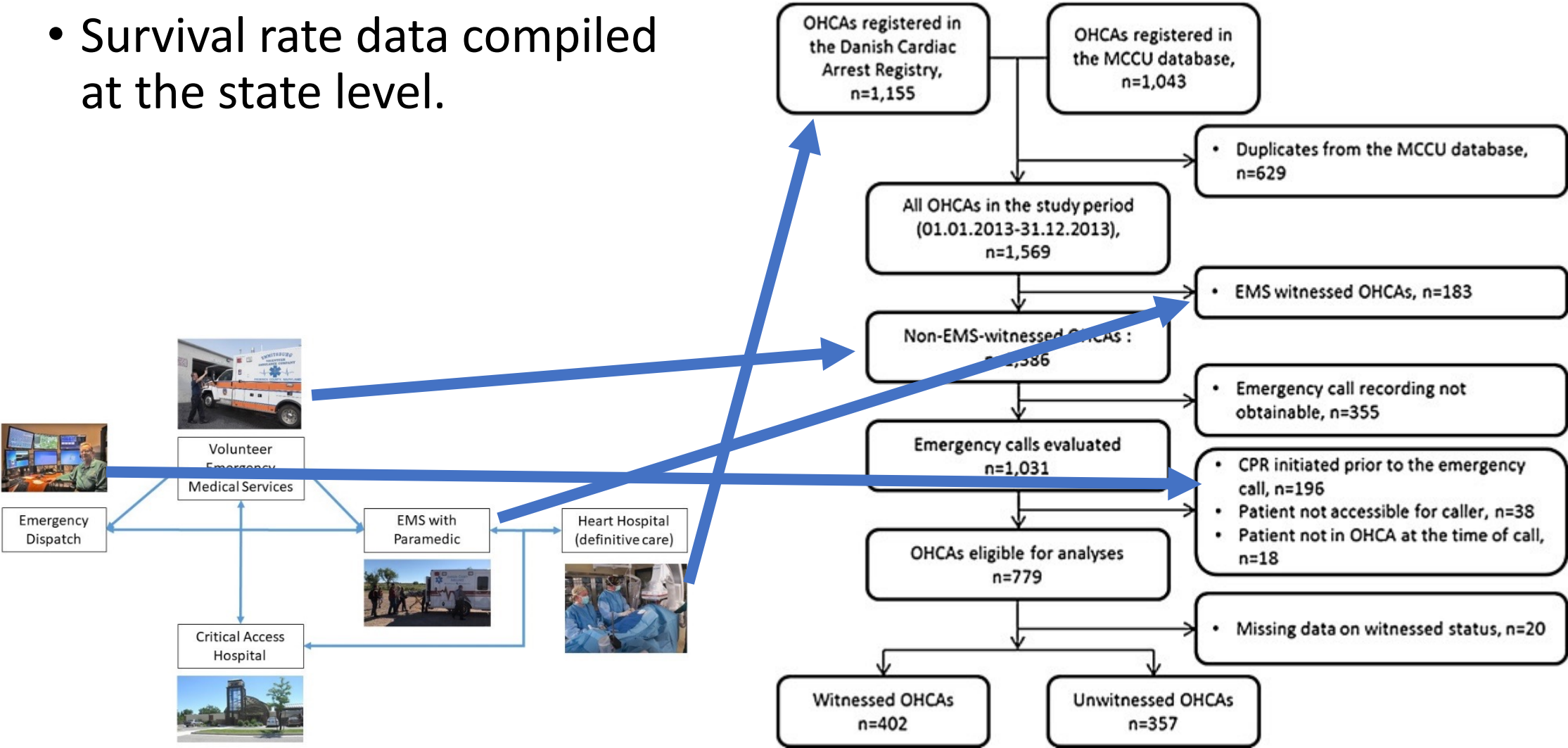
Who is responsible for collecting data on the emergent property?

- Those overseeing the system (complex intervention).
- Friedman (RBA): community level indicators.
- Not individual system parts.



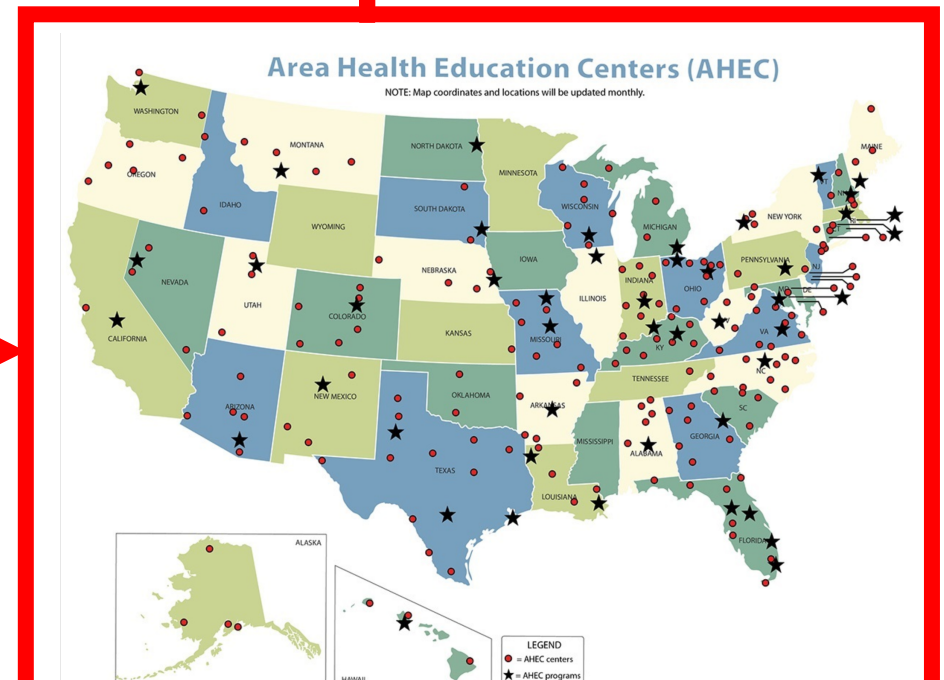
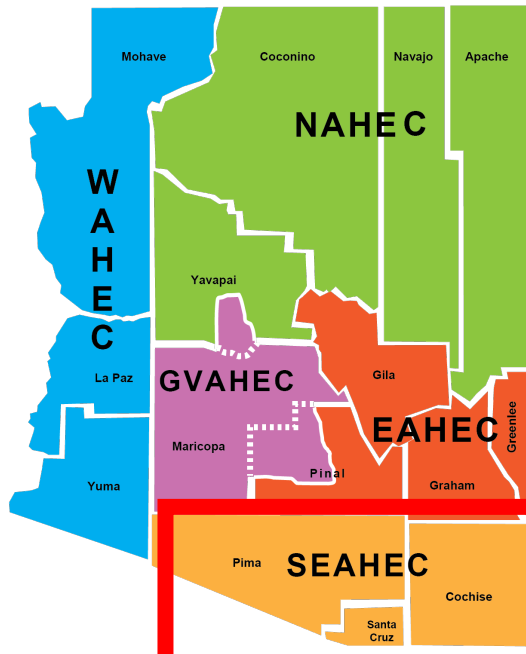
Cardiac Care System

- Survival rate data compiled at the state level.



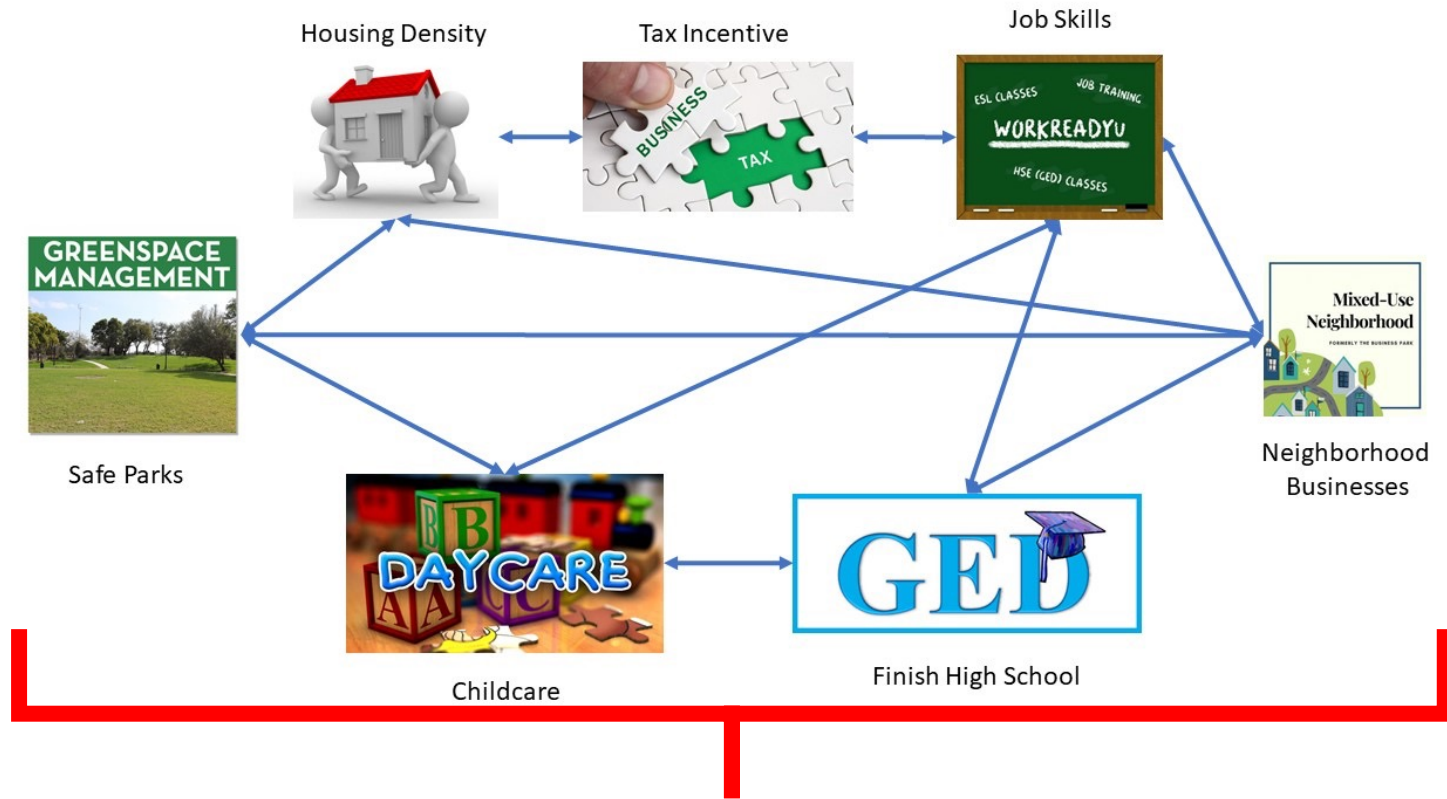
AHEC system

The screenshot shows the WHO website's 'Routine Health Information Systems (RHIS)' page. The top navigation bar includes 'World Health Organization', 'Health Topics', 'Countries', 'Newsroom', 'Emergencies', 'Data', and 'About WHO'. Below the navigation, there is a brief introductory text about the importance of RHIS data for assessing COVID-19 impact. The main content area features a blue graphic with a bar chart and a medical cross icon. To the right of the graphic, there is descriptive text about RHIS and two links: 'Toolkit for Routine Health Information System data' and 'RHIS - Global consultation'. The bottom of the screenshot shows a Windows taskbar with the date 4/23/2022 and time 2:35 PM.



HUD HOPE VI

- Survey of all participants by external evaluator.



A pitfall of evaluating emergence

- It does not make sense to evaluate the effectiveness of individual system parts because they are “interdependent”.
- The emergent property is a “product” of the interaction of parts. (Ackoff). It’s not summative!

Stepwise Regression

- How it works (typically) - assume k independent variables
- Step 1: All possible models: $E(y) = \beta_0 + \beta_1 x_k$ are fit ←
 - Chooses most significant x_i
- Step 2: All possible models: $E(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_k$ are fit ←
 - x_1 is the variable that was selected in Step 1
 - Chooses most significant x_i from the remaining x 's
- Continues until no other x 's can be added at specified alpha level.

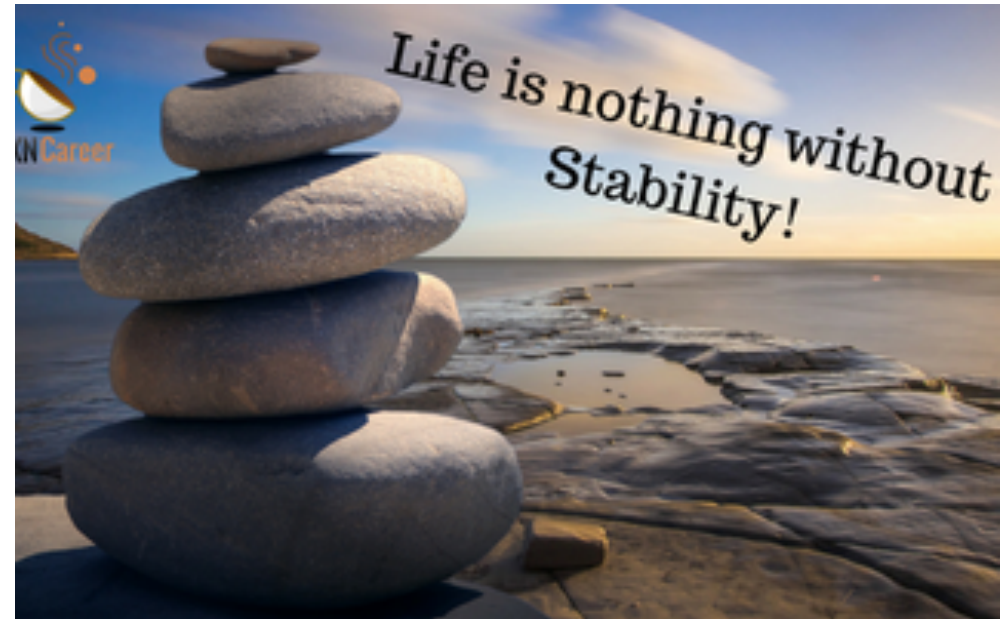
You know *what* to evaluate, but the *how* may be challenging

- The emergent property is often multidimensional.

- E.g., Stability
 - Mental component.
 - Physical component.
 - Financial component.

- Indicators could be useful.

- Tenure
 - work position (stability).
 - Businesses.
- Purchasing a home.
- Support systems in place.



- Could also borrow from other professions, like Psychology.

- They developed methods and tools for many multidimensional constructs.

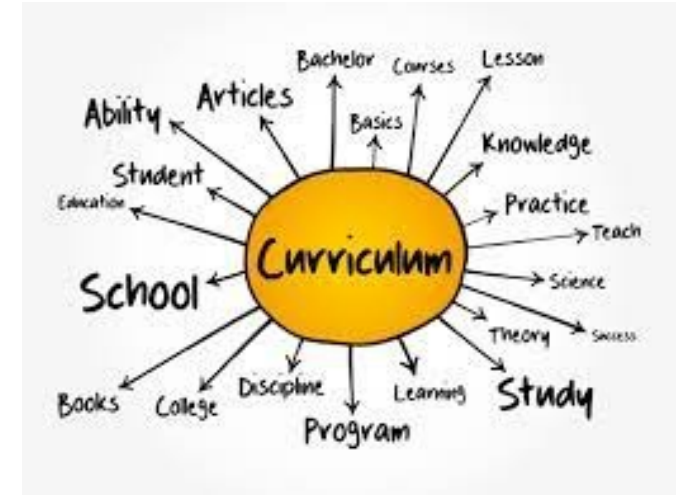
Evaluating programs using a systems lens

- Start with a system test.
- Maybe it is called a program but it is acting as a system.
 - HUD is labeled a “program”, but is a complex intervention acting as a system.
- In this case...apply SET as you normally would.
- If not acting as a system, then apply system principles to create more robust evaluation.
 - Apply SET step 2 (process).
 - Apply SET step 3 (outcome).

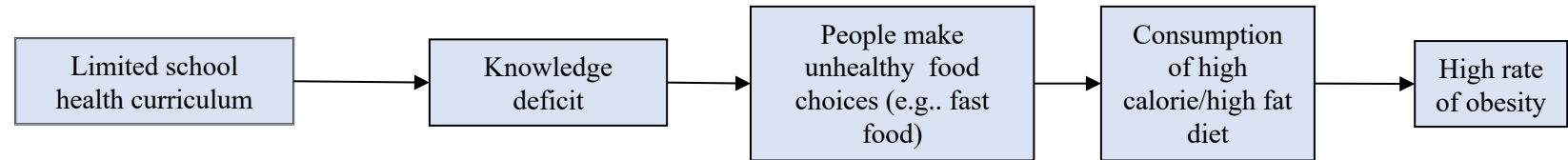


Applying SET Step 2 to the process evaluation

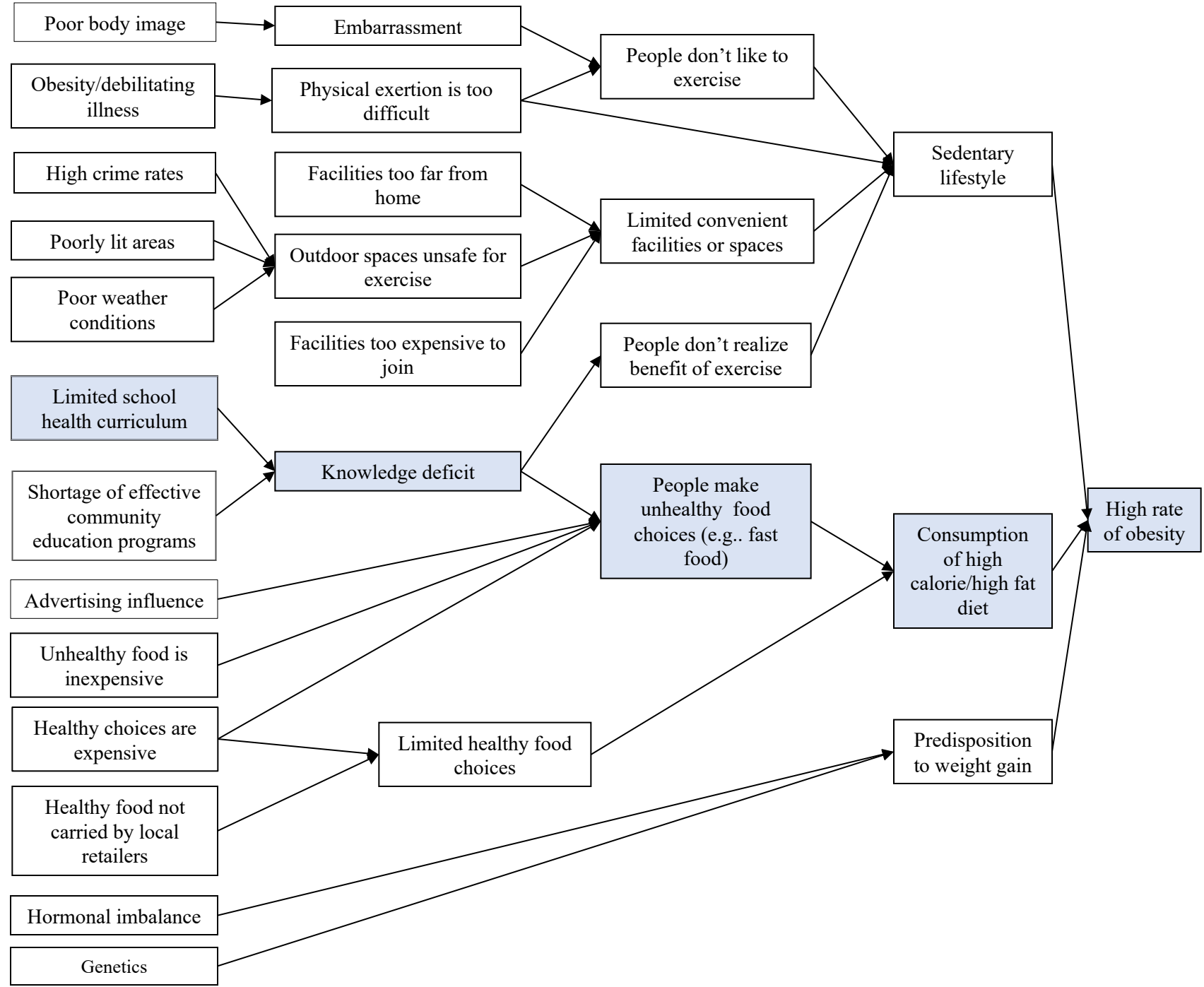
- Process evaluation: Was the curriculum delivered as intended?
- Applying systems principles can add more meaning to the process evaluation.
- Program evaluation:
 - Did instructor cover all the material?
 - Did participants complete all the hours?
- System evaluation:
 - Were feedback loops closed with students?
 - Did instructors provide specific and timely responses?
 - Was the instructor deemed credible?
 - Was the material covered relevant?
 - Is instructor providing feedback at regular intervals?
- If a program fails, its often around communication issues. A systems lens will help focus on those communication issues.
- Near real time! (as opposed to waiting until end of a program delivery cycle).



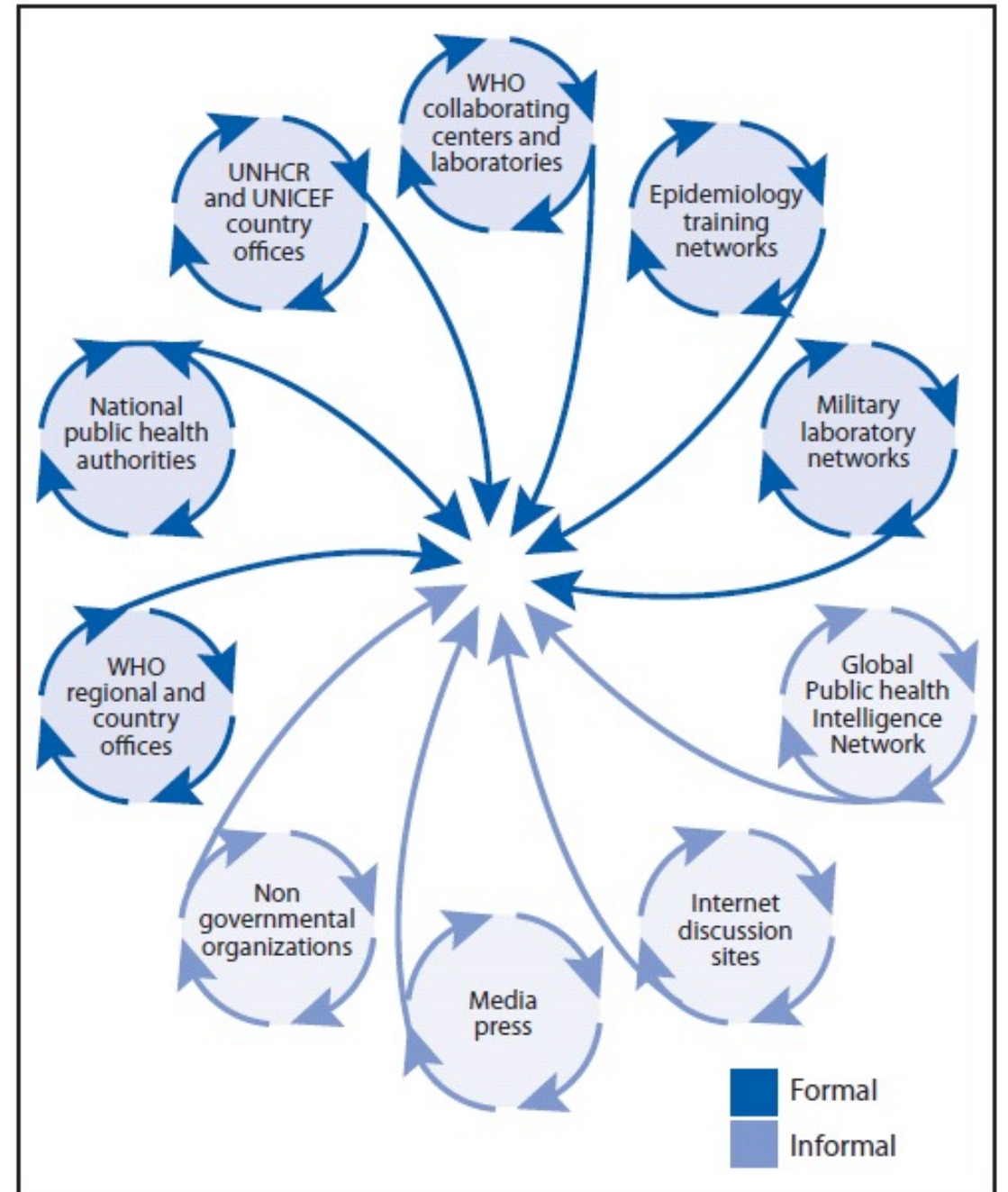
Program Logic Model



Assumptions	Strategy	Outcomes		
		Immediate	Intermediate	Long-term
Increased knowledge → better food choices.	Health Curriculum	Increased knowledge		
Better choices → better diet.			Healthier food choices	
Better diet → reduced obesity.				Reduction in obesity rates.



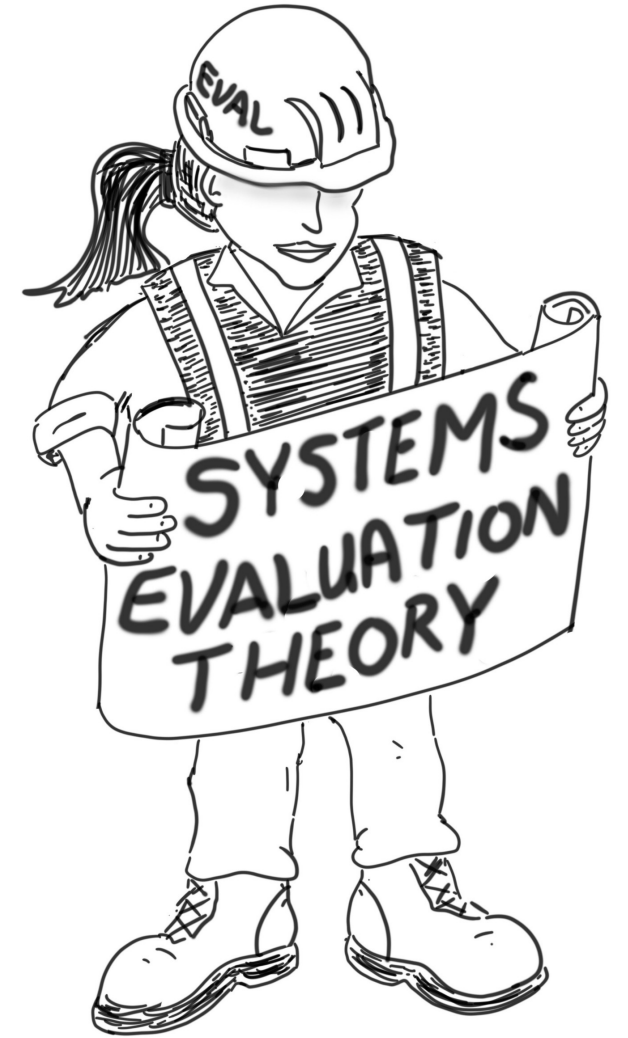
- In this example, an agency like the CDC might collect data on the burden of chronic disease.



The advantages of using a systems lens to evaluate interventions not acting as a system.

- Process evaluation:
 - More robust, focusing on things more likely to lead to implementation failure.
- Outcome evaluation:
 - Creates realistic expectations about what a program can change.
 - This lifts the burden from programs by only holding them responsible for outcomes over which they have direct and immediate control to change.





• ralph@justevaluation.com

Safe Parks



Housing Density



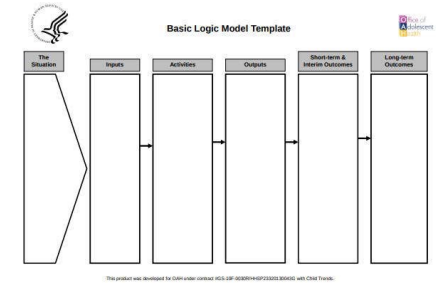
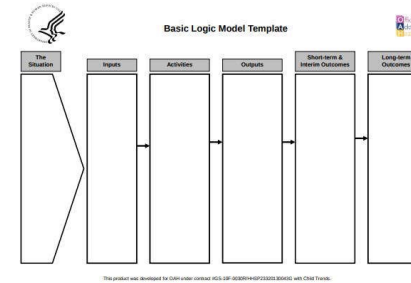
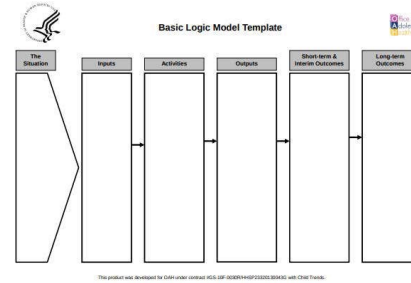
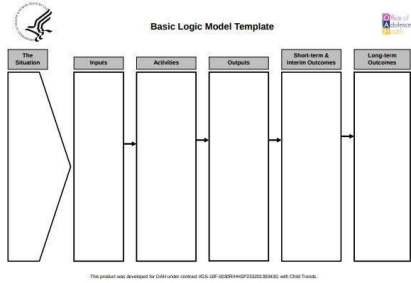
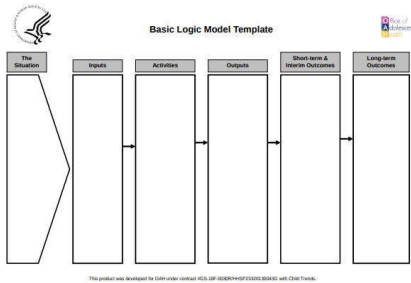
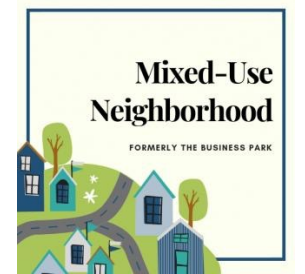
Tax Incentive



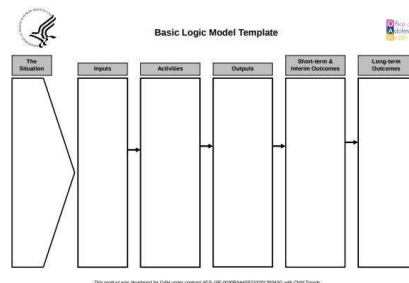
Job Skills



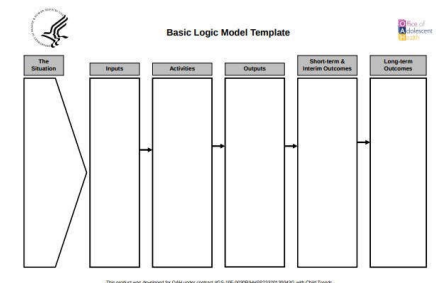
Neighborhood Businesses



Childcare



Finish High School



Safe Parks



Housing Density



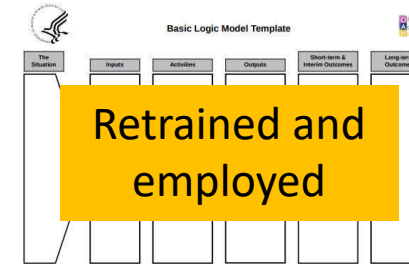
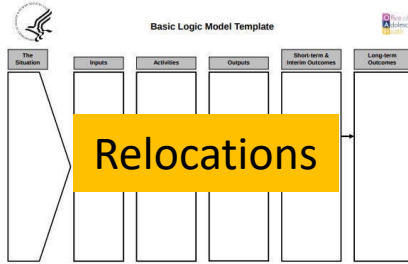
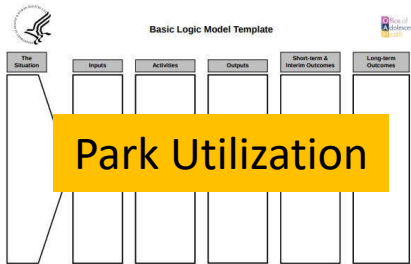
Tax Incentive



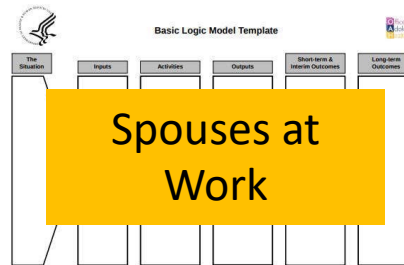
Job Skills



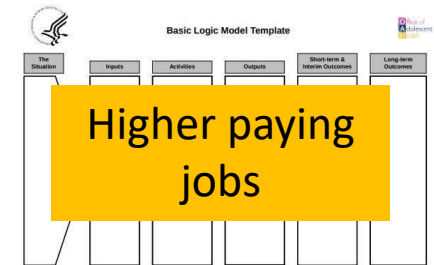
Neighborhood Businesses



Childcare



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Housing Density



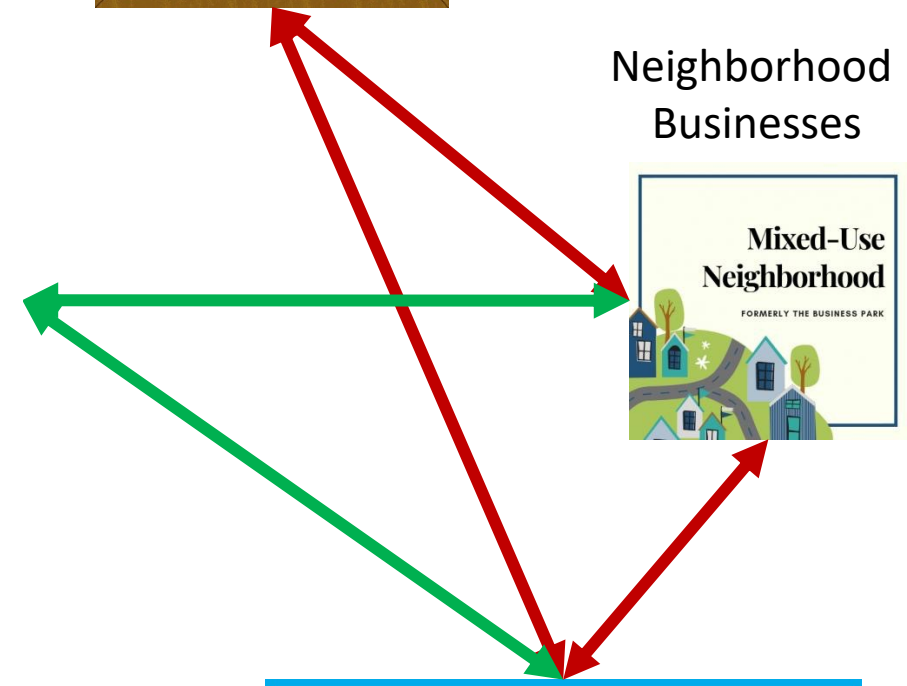
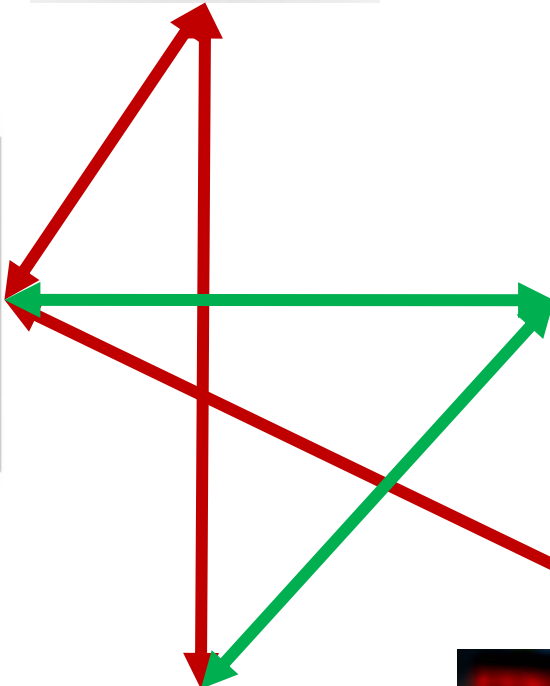
Job Skills



Safe Parks



Neighborhood Businesses



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