Systems Thinking in Communities:

Understanding the Causes of Inactivity, Poor Diet/Nutrition, and Childhood Obesity in Kansas City, Missouri and Kansas

kchealthykids™

Empowering Communities for Healthy Eating & Active Living

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Introduction

Kansas City Healthy Kids Initiative is one of 49 community partnerships participating in the national *Healthy Kids, Healthy Communities* program of the Robert Wood Johnson Foundation (www.healthykidshealthycommunities.org). The purpose of this *Kansas City Healthy Kids Initiative* project was to introduce systems thinking at the community level by identifying the essential parts of the Kansas City, Missouri and Kansas system and how the system influences policy and environmental changes to promote healthy eating and active living as well as to prevent childhood obesity. To accomplish this goal, community partners and residents participated in a group model building session and discussions. The group model building exercises were designed by staff from Transtria LLC and the Social System Design Lab at Washington University in St. Louis, Missouri as part of the *Evaluation of Healthy Kids, Healthy Communities* funded by the Robert Wood Johnson Foundation. These exercises actively involved a wide range of participants in modeling complex systems and provided a way for different representatives (e.g., residents, elected officials, government agencies, community-based organizations, businesses) to better understand the systems (i.e., dynamics and structures) in the community (see the *Healthy Kids, Healthy Communities Group Model Building Facilitation Handbook*, www.transtria.com/hkhc). Overall, the evaluation was designed to assess policy, system, and environmental changes as a result of the community partnerships' efforts to increase healthy eating and active living in order to reduce childhood obesity.

Kansas City, Missouri and Kansas: Background and Local Participation

Kansas City, Kansas (KCK) and Kansas City, Missouri (KCMO) are adjacent, separated only by the Kansas/ Missouri state line. They are at the center of a nine-county region which has 1.8 million residents. Together, their population is 577,523, with 76% of those residents living in Kansas City, Missouri. In the two cities combined, 61.5% percent of the population is White, 29.1% is black, and 13.1% is Hispanic. The median household income is $40,616; however, lower median income levels predominate in the cities' urban areas. Data from the Behavioral Risk Factor Surveillance System for the bi-state Kansas City metropolitan area found that 36.2% of residents 18 years and older are overweight; 27.2% are obese (2006). Score 1 for Health data (2005-2006) show that in school-aged children in grades K through 5, overweight/obesity rates range from 26% for Asian females to 50% for Hispanic males. Rates for black and white males are 38%; for black and white females, they are 39% and 36%, respectively. The entire area is impacted by urban sprawl and the movement of the region's development from the urban core to the suburbs, as referenced in an August 2006 Research Brief of the Brookings Institute. This has led to the deterioration of the core and inequities in access to healthy eating and active living opportunities.

The Hartwig Legacy Foundation, the lead agency for the HKHC grant, was a relatively young organization, which became incorporated in December 2005. The lead agency focused on policy and environmental change to support healthy eating and active living as part of KC Healthy Kids and more broadly across the region. The lead agency was involved in brokering relationships and developing new strategies to help support policy and environmental changes for healthy communities and securing funds to help support the initiatives for healthy eating and active living throughout the region and within the partnering neighborhood communities.

The larger coalition/partnership umbrella broadly served three separate communities, Rosedale, Ivanhoe, and Douglass-Sumner. Each individual community had its own separate and unique partnerships. Each community had one key leader or agency serving as the community organizer. Through the Robert Wood Johnson Foundation grant, the lead agency had a sub-contract with the Rosedale Development Association and the Ivanhoe Neighborhood Council, which allowed each to receive $50,000 to support the community organizers at the agency for HKHC efforts. State and regional partnerships served the larger coalition and individual community partnerships.

- **The Rosedale Development Association** was the organizing group for the local efforts in Rosedale, Kansas working to connect the community and advocate on behalf of the residents. The Rosedale Development Association was established many years prior to the HKHC project and became involved with KCHK in 2008.
- **The Ivanhoe Neighborhood Council** was established in 1967, but was dormant until 1997 when one

family decided it was time to advocate for a safer and healthier neighborhood. The family became involved in the Kansas City HKHC project in 2010 because of its long history with community capacity and collaboration with residents.

- **The Douglass-Sumner** community partnership was established about 15-18 months prior to the interview, which coincided with the available funding. The Douglass-Sumner community partnership became involved with the Kansas City project in early 2011. Robert Wood Johnson Foundation funds were not used for the Douglass-Sumner community. Funds for this community were administered through Local Initiative Support Corporation and passed through to Kansas State. Kansas State hired the community organizer for Douglass-Sumner. Community organizing in the Douglass-Sumner partnership was more difficult than in the Rosedale and Ivanhoe communities. The Douglass-Sumner community received less funding, approximately $40,000, and the partnership and/or lead agency sought additional funding to help support the community efforts.

Community organizers met monthly to work together in sharing project experiences and challenges. The larger partnership/coalition does not meet on a regular basis, but more on a project-specific basis. The broad coalition contains multiple partnerships with a variety of organizations, foundations, and agencies in and around Kansas City, Kansas and Kansas City, Missouri.

Kansas City Healthy Kids Initiative's Priorities and Strategies

The partnership and capacity building strategies of *Kansas City Healthy Kids Initiative* included:

- **Community Organizers:** Local community organizers from Ivanhoe Neighborhood Council and Rosedale Development Association were selected to spearhead the local work in their neighborhoods. These organizers had existing relationships with community residents, which made the healthy eating and active living efforts of KC Healthy Kids work a natural fit for the neighborhoods.
- **Food Policy Coalition***:* A regional food policy coalition was developed to work on food issues including access to water, urban agriculture zoning laws, and creating food desert maps.

The healthy eating and active living strategies of *Kansas City Healthy Kids Initiative* included:

- **Urban Agriculture/Community Gardens:** Healthy Kids Initiative focused on community-based agriculture through the introduction of community, demonstration, school, and home gardens. Regionally, partners led advocacy efforts for policy development and implementation to promote equitable access to water, while local neighborhoods developed community support and capacity to grow and sustain community and home gardens.
- **Farmers' Markets:** Healthy Kids Initiative wanted to expand access to affordable and healthy foods through the pilot of the Beans and Greens mobile market, Ivanhoe Small Growers Farmers' Market, Rosedale Farmers' Market, and adding nutrition assistance programs to the markets.
- **Parks and Play Spaces:** Healthy Kids Initiative wanted to create access to opportunities for physical activity through the redevelopment of parks and the transformation of vacant lots into pocket parks including three parks in Ivanhoe and joint use agreements and trail development in Rosedale.
- **Active Transportation:** Healthy Kids Initiative worked regionally to create Complete Streets policy and then worked locally with areas to adopt the policy. Additional local efforts in Rosedale were targeted toward engaging residents in creating sidewalk and corridor master plans and beginning to implement the plans through infrastructure changes including sidewalks, bike lanes, cross walks, and other amenities.
- **Other Strategies:** Healthy Kids Initiative started a plan to create a healthy restaurant initiative and supported the addition of a grocery store.

For more information on the partnership, please refer to the Kansas City case report (www.transtria.com/hkhc).

Systems Thinking in Communities: Kansas City, Missouri and Kansas

"Systems thinking" represents a range of methods, tools, and approaches for observing the behaviors of a system (e.g., family, community, organization) and how these behaviors change over time; changes may occur in the past, present, or future. Figure 1 illustrates a system of policies, environments, local collaborations, and social determinants in *Kansas City, Missouri and Kansas* that influence healthy eating, active living, and, ultimately, childhood obesity. This system and the dynamics within the system are complicated with many different elements interacting.

Models, such as Figure 1, provide a way to visualize all the elements of the system and their interactions, with a focus on causal relationships as opposed to associations. Through the model, specific types of causal relationships, or feedback loops, underlying the behavior of the dynamic system, can be identified to provide insights into what is working or not working in the system to support the intended outcomes (in this case, increases in healthy eating and active living, and decreases in childhood overweight and obesity). In system dynamics, the goal is to identify and understand the system feedback loops, or the cause-effect relationships that form a circuit where the effects "feed back" to influence the causes.

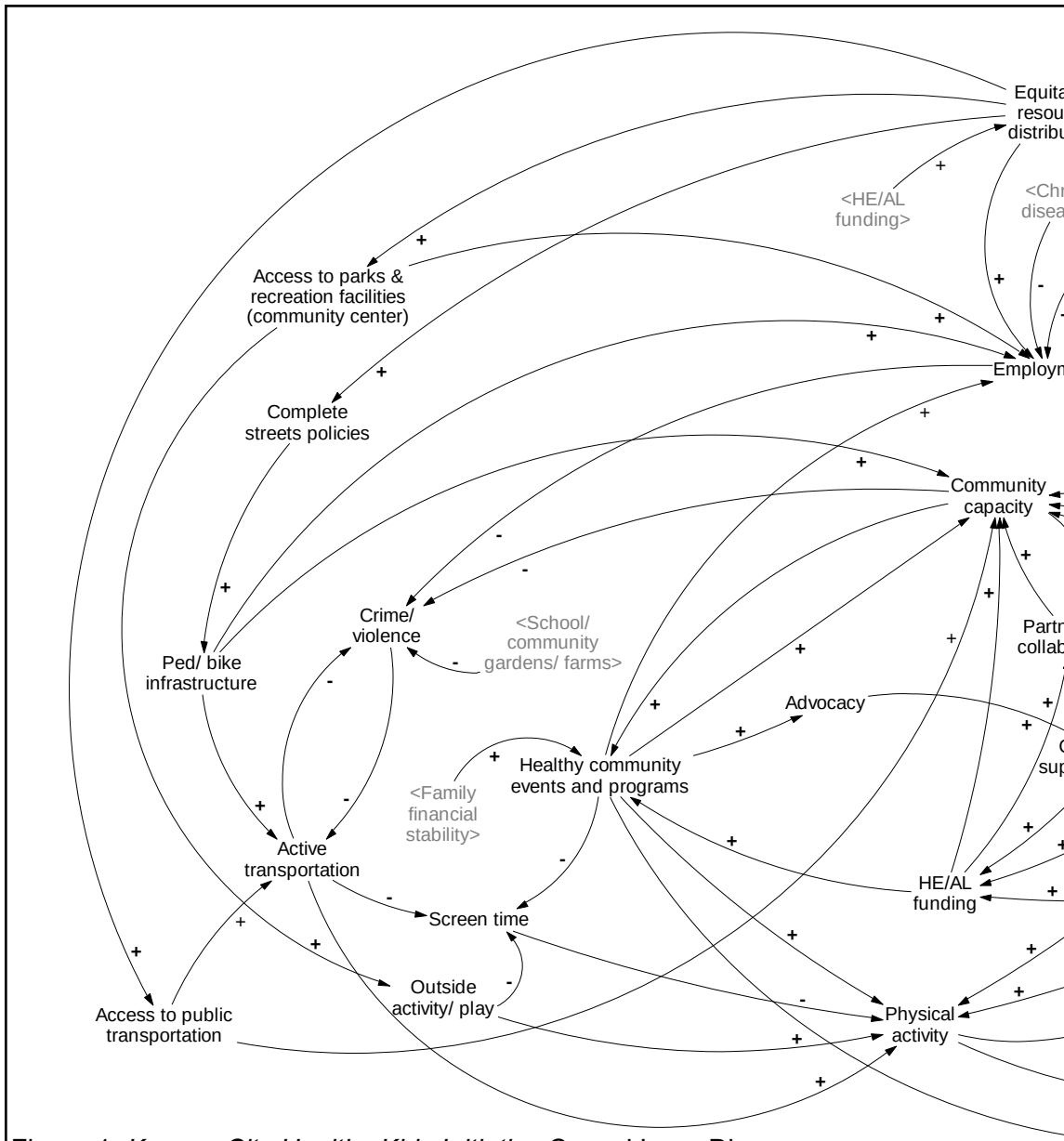
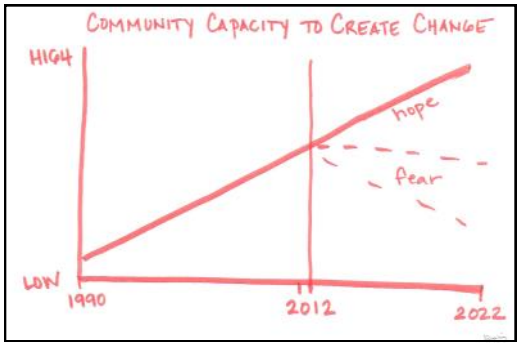


Figure 1: *Kansas City Healthy Kids Initiative* Causal Loop Diagram

Group Model Building

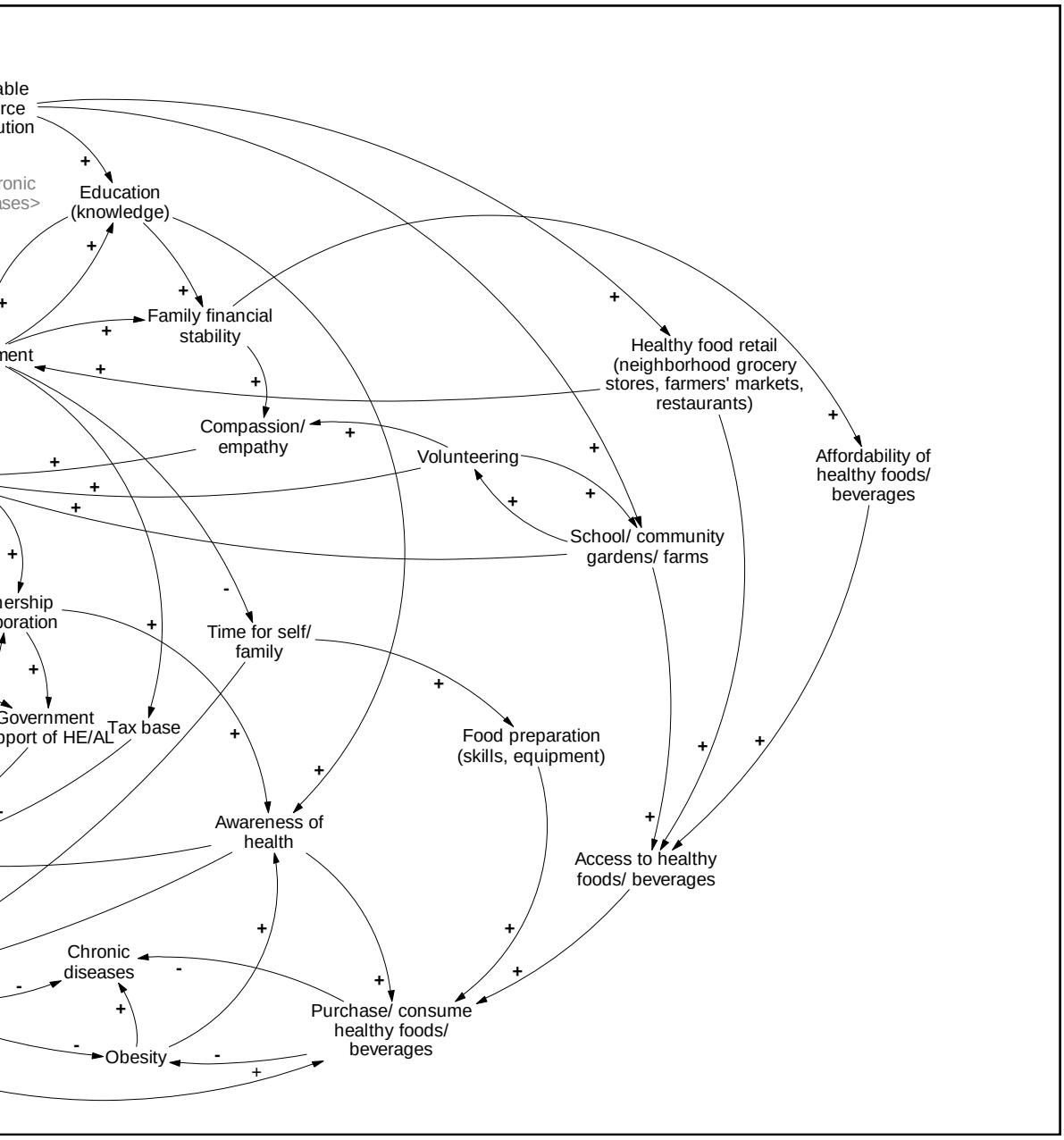
Members of the *Kansas City Healthy Kids Initiative* partnership participated in a group model building session in October, 2012 and generated this system. also referred to as a causal loop diagram (Figure 1). Participants in the group model building session included residents and representatives from foundations, community-based organizations, and advocates. The group model building session had two primary activities: 1) a Behavior Over Time Graph exercise; and 2) a Causal Loop Diagram (or structural elicitation) exercise.



Behavior Over Time Graphs

To identify the range of things that affect or are affected by policy, system, and environmental changes in Kansas City related to healthy eating, active living, and childhood obesity, participants designed graphs to name the influences and to illustrate how the influences have changed over time (past, present, and future). In this illustration for community capacity to create

change, the amount of community capacity has increased steadily since 1990 and the participant hopes that this increase will continue into the future. Each graph is a tool to increase the use of common, specific language to describe *what* is changing in the community as well as *when*, *where*, and *how* it is changing. The graphs capture participants' perceptions of the influence, or variable, and through the graph, the participant tells their story. These perceptions are based on actual data or evidence, or they are part of the participants' lived experience.



Causal Loop Diagram

To examine the relationships among the variables from the behavior over time graphs, participants worked together and with facilitators to develop a causal loop diagram. In Figure 1, the words represent variables of quantities that can increase and decrease over time (i.e., the behavior over time graphs). These variables are influenced by other variables as indicated by the lines with arrows. The lines with arrows represent causal relationships - this is what is known about the system and how it behaves.

One feedback loop is: community capacity → partnership collaboration → government support of healthy eating (HE)/ active living (AL) → HE/ AL funding → community capacity.

What is important to notice is that there are other feedback loops interacting simultaneously to influence or to be influenced by community capacity. Some variables may increase community capacity while other variables limit it. Determining the feedback loop or loops that dominate the system's behavior at any given time is a more challenging problem to figure out, and ultimately, requires the use of computer simulations.

Based on this preliminary work by the *Kansas City Healthy Kids Initiative* partnership, this "storybook" ties together the behavior over time graphs, the participants' stories and dialogue, and feedback loops from the causal loop diagram to understand the behavior of the system affecting health in Kansas City, Missouri and Kansas and to stimulate greater conversation related to Kansas City's theory of change, including places to intervene in the system and opportunities to reinforce what is working. Each section builds on the previous sections by introducing concepts and notation from systems science.

Causal Loop Diagram for the Childhood Obesity System

The causal loop diagram (CLD) represents a holistic system and several subsystems interacting in Kansas City, Missouri and Kansas. In order to digest the depth and complexity of the diagram, it is helpful to examine the CLD in terms of the subsystems of influence. Because of this project's focus on healthy eating, active living, and childhood obesity, this system draws attention to a number of corresponding subsystems, including: healthy eating policies and environments (red), active living policies and environments (blue), health and health behaviors (orange), partnership and community capacity (purple), and social determinants (green).

From the group model building exercises, several variables and causal relationships illustrated in Figure 2 were identified within and across subsystems. This section describes the subsystems in the CLD.

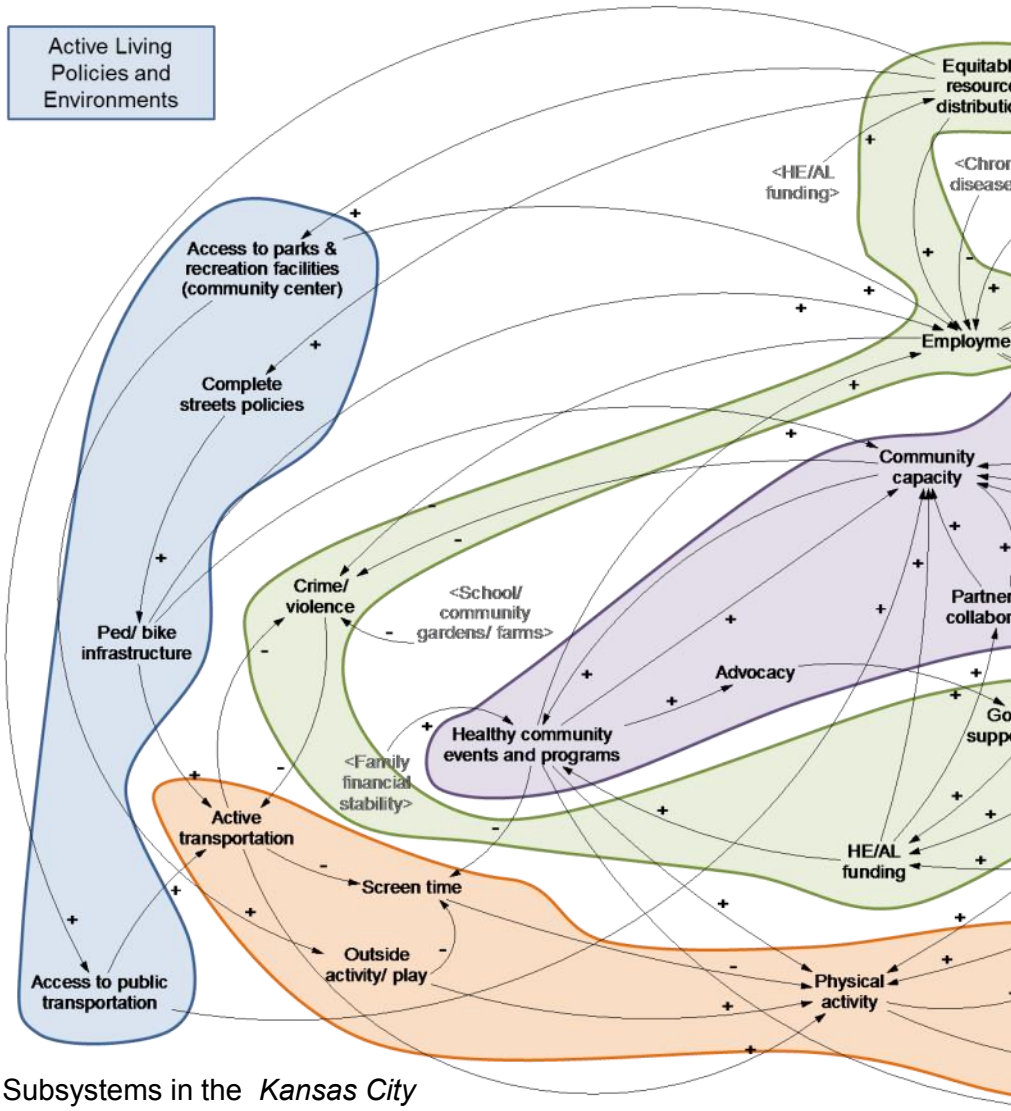


Figure 2: Subsystems in the *Kansas City Healthy Kids Initiative* Causal Loop Diagram

Healthy Eating Policies and Environments (Red)

The healthy eating policy and environmental subsystem includes food production, food distribution and procurement, and food retail. During the behavior over time graphs exercise, the participants generated 10 graphs related to policy or environmental strategies (e.g., school/ community gardens/ farms) or contexts (e.g., healthy food retail) that affected or were affected by the work of *Kansas City Healthy Kids Initiative*. The variables represent participants' conversations from the behavior over time graph and causal loop diagram exercises.

Active Living Policies and Environments (Blue)

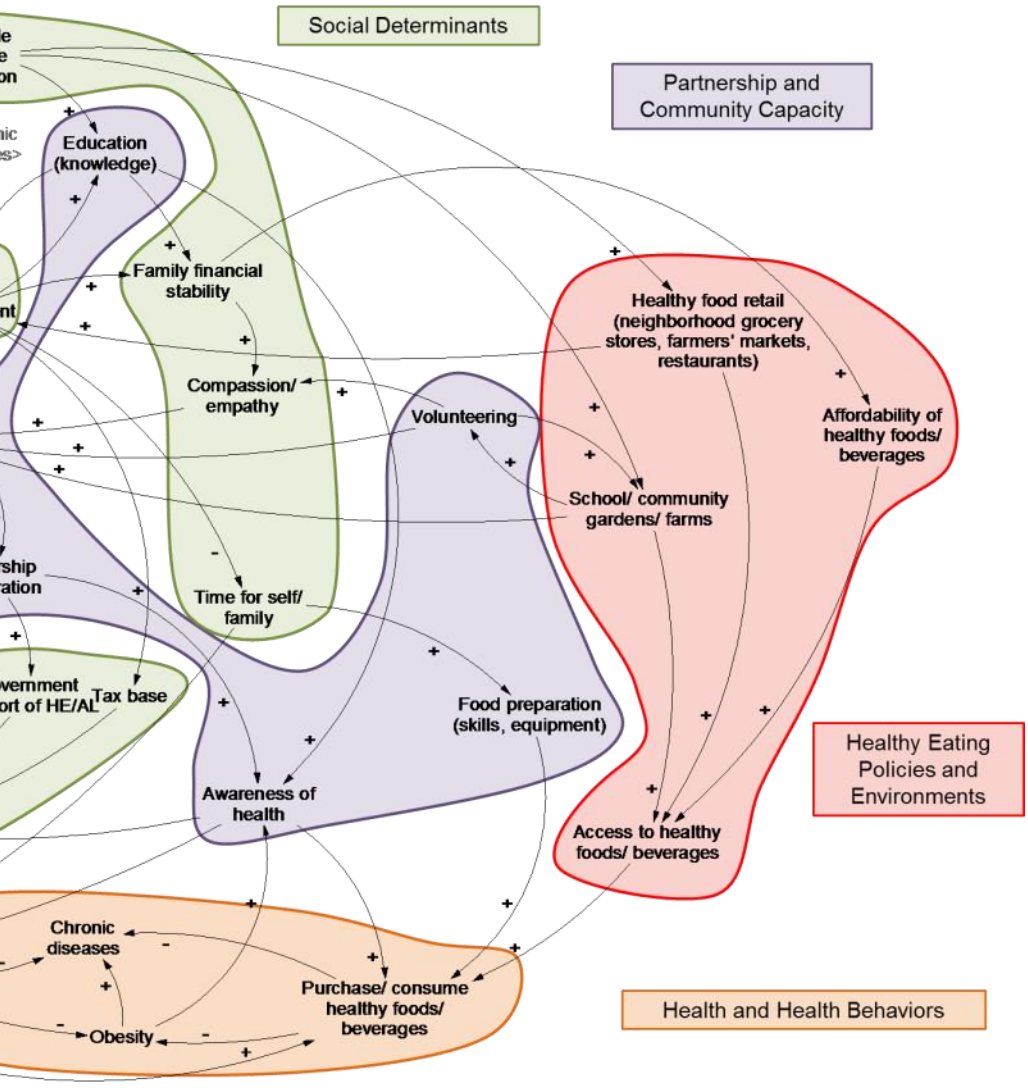
The active living policy and environmental subsystem includes design, planning, construction, and enforcement or maintenance related to access to opportunities for active transportation and recreation. For this topic, the group model building participants developed 7 graphs related to policy or environmental strategies (e.g., complete streets policies) or contexts (e.g., access to parks and recreation facilities) that affected or were affected by the partnership's work.

Health and Health Behaviors (Orange)

The subsystem for health and health behaviors includes health outcomes (e.g., obesity), health behaviors (e.g., healthy eating, physical activity), and behavioral proxies or context-specific behaviors (e.g., active transportation, outside activity/ play, purchase healthy foods and beverages).

Partnership and Community Capacity

The partnership and community capacity subsystem refers to the ways communities organized and rallied for changes to the healthy eating and active living subsystems. For instance, *Kansas City Healthy Kids Initiative* worked toward partnership and collaboration through the food policy coalition. This subsystem also includes community factors outside the partnership that may influence or be influenced by their efforts, such as volunteering.



Social Determinants

Finally, the social determinants subsystem denotes societal conditions (e.g., equitable resource distribution) and psychosocial influences (e.g., compassion or empathy) in the community that impact health beyond the healthy eating and active living subsystems. In order to achieve health equity, populations and subgroups within the community must have equitable access to these resources and services.

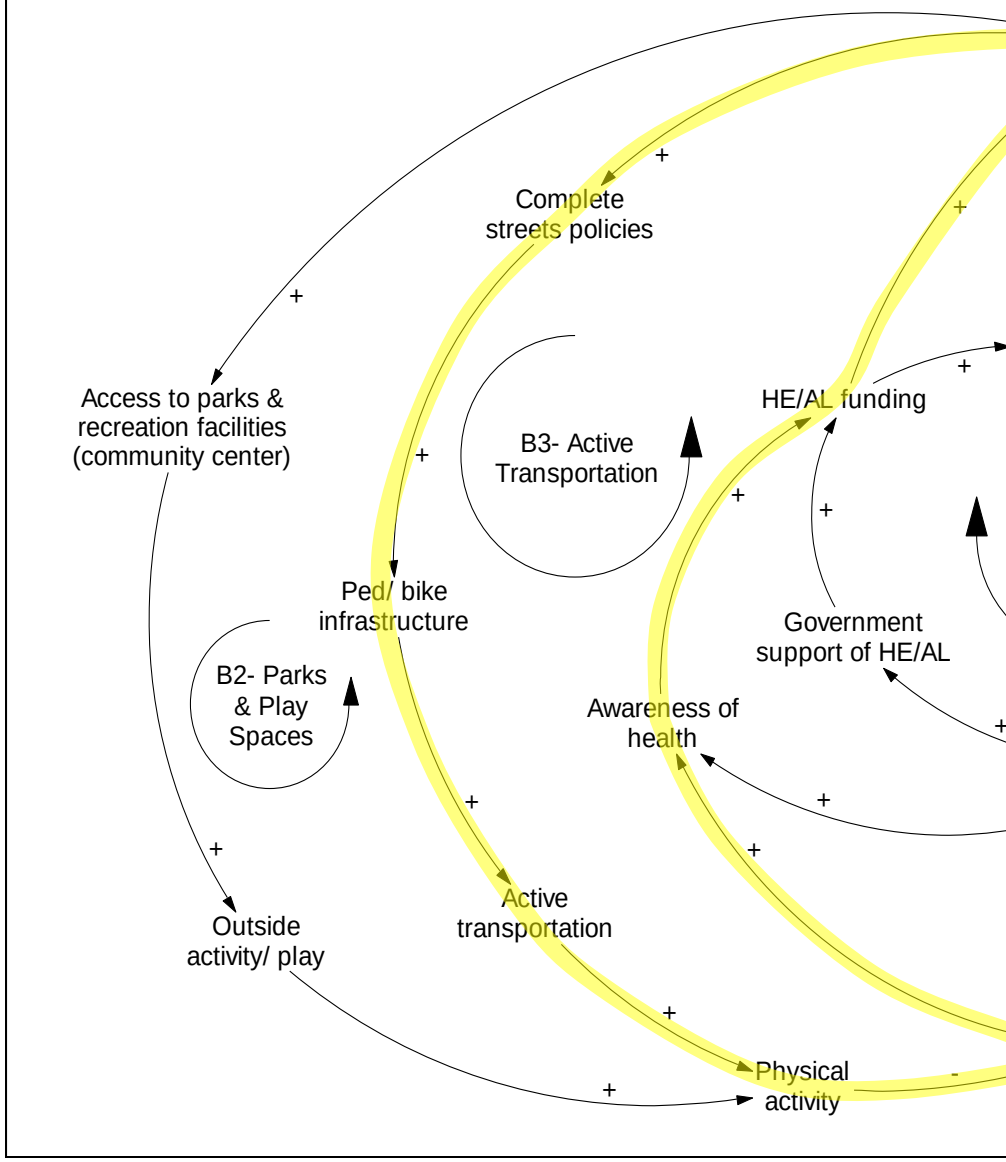
Each one of these subsystems has many more variables, causal relationships (arrows), and feedback loops that can be explored in greater depth by the *Kansas City Healthy Kids Initiative* partners or by other representatives in Kansas City, Missouri. Using this CLD as a starting place, community conversations about different theories of change within subsystems may continue to take place. For instance, these participants identified interest in understanding more about the relationships among <variable>, <variable>, and <variable>.

The next sections begin to examine the feedback loops central to the work of *Kansas City Healthy Kids Initiative*. In these sections, causal relationships and notations (i.e., arrows, “+” signs, “-” signs) from Figure 2 will be described to increase understanding about how systems thinking and modeling tools can work in communities to increase understanding of complex problems that are continuously changing over time, such as childhood obesity. At the end of this CLD storybook, references to other resources will be provided for those interested in more advanced systems science methods and analytic approaches.

Active Transportation Feedback Loop

To simplify the discussion about feedback loops, several loops drawn from the Kansas City Healthy Kids Initiative CLD (see Figures 1 and 2) are shown in Figure 3. While the CLD provides a theory of change for the childhood obesity prevention movement in Kansas City, Missouri, each feedback loop tells a story about a more specific change process.

Figure 3: Active Transportation Feedback Loop



Causal Story for Feedback Loop

Story A: In this case , the story is about the active transportation (yellow highlighted loop in Figure 3). Kansas City, Missouri partners worked regionally to create a Complete Streets policy, collaborated locally to adopt the policy, engaged residents in creating sidewalk and corridor master plans, and started implementation of the plans (e.g., sidewalks, bike lanes, crosswalks). Participants described how Complete Streets policies improve pedestrian and bike infrastructure in order to increase active transportation, contributing to higher rates of physical activity and lower rates of obesity. In turn, lower rates of obesity require less efforts to build awareness and generate funding and resources for active transportation, once the policies are in place and enforced.

Story B: While the preceding story reflected a positive scenario for Kansas City, Missouri, the same feedback loop also tells the opposite story. A lack of Complete Streets policies often results in poorer condition, or an absence of, pedestrian and bike infrastructure, limiting active transportation, reducing physical activity, and increasing rates of obesity. In response, more efforts are required to increase awareness of the obesity rates and to designate funding and resources to develop policies and environments to support active transportation in Kansas City.

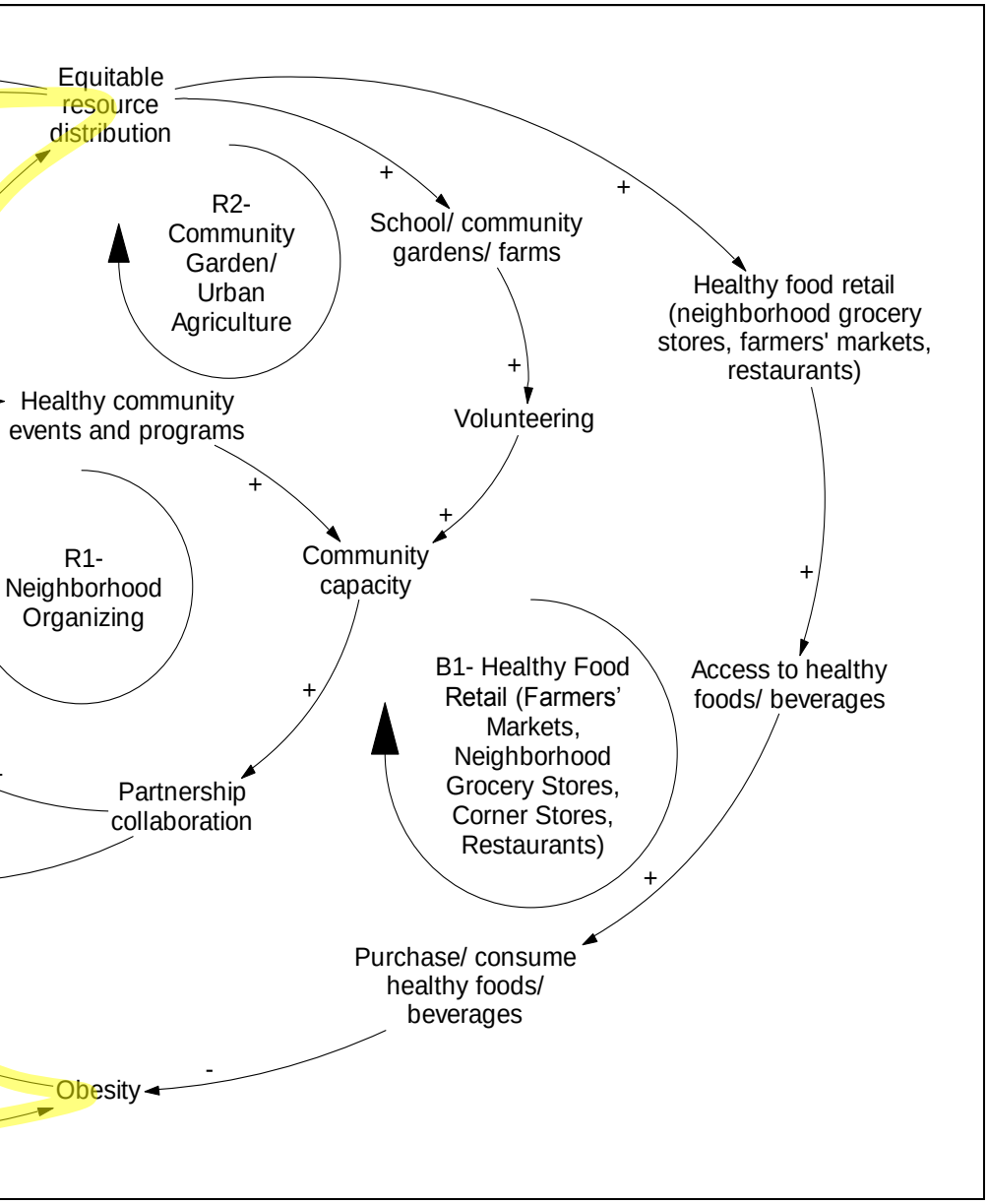
Balancing Loop and Notation

These stories represent a balancing loop, and the notation in the feedback loop identifies it as a balancing loop (see “B3 — Active Transportation” and yellow highlighted loop in Figure 3). The words represent variables of quantities that increase and decrease as illustrated in the stories above. These variables change over time and are influenced by other variables as indicated by the arrows. Each arrow represents a causal relationship, and the plus and minus signs on the arrows indicate whether or not the influence of one variable on another variable (1) increases/adds to (plus or “+” sign), or (2) decreases/removes from the other variable (minus or “-“ sign). These signs are referred to as polarities.

“I think, with programs like the walking school bus, it draws attention to the things we need in the community which then brings the funding and infrastructure.” (Participant)

In a balancing loop, the effect of the variables tend to create more of a stable trend over time, as opposed to one that is continually increasing or decreasing. This effect continues through the cycle and returns a stabilizing influence to the original variable, respectively.

Looking specifically at the "+" or "-" notation, a feedback loop that has an odd number of "-" signs, or polarities in the loop, is considered a balancing loop. Reinforcing loops, with zero or an even number of "-" signs, are another type of feedback loop.



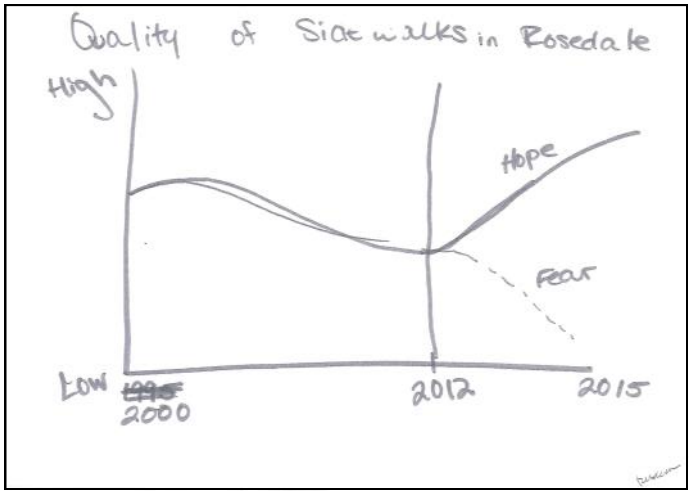
In isolation, this balancing loop represents the influence of Complete Streets policies on physical activity and obesity. To understand other influences on these variables, it is important to remember that this reinforcing loop is only one part of the larger CLD (see Figures 1 and 2), and the other loops and causal relationships can have an impact on the variables in this loop.

<u>System Insights for *Kansas City Healthy Kids Initiative*</u>

Participants also identified a decrease in the quality of sidewalks in the Rosedale community of Kansas City, Missouri (see behavior over time graph).

From the systems thinking exercises, several insights can inform the partners' active transportation strategy. For instance, efforts to draw attention to absent or poor quality pedestrian and bike infrastructure through programs like Safe Routes to School (see quote on previous page) may help to prioritize funding for active living initiatives that result in Complete Streets policies, particularly where community members have concerns about higher rates of obesity.

In addition to these insights, systems thinking can also help to pose key questions for assessment and evaluation, including assessment of Complete Streets policy components, environmental changes, and active transportation behaviors; economic evaluation of resources invested in policy implementation and enforcement; and evaluation of funding decisions to increase equitable distribution of resources.



Opportunities for Systems Thinking in Kansas City, Missouri

This storybook provided an introduction to some basic concepts and methods for systems thinking at the community level, including: causal loop diagrams, variables, causal relationships and polarities, reinforcing feedback loops, and balancing feedback loops, among others. For the *Kansas City Healthy Kids Initiative* partners, this storybook also summarized the healthy eating, active living, partnership and community capacity, social determinants, and health and health behaviors subsystems in the Kansas City causal loop diagram as well as an example feedback loop corresponding to the partnership's primary strategies.

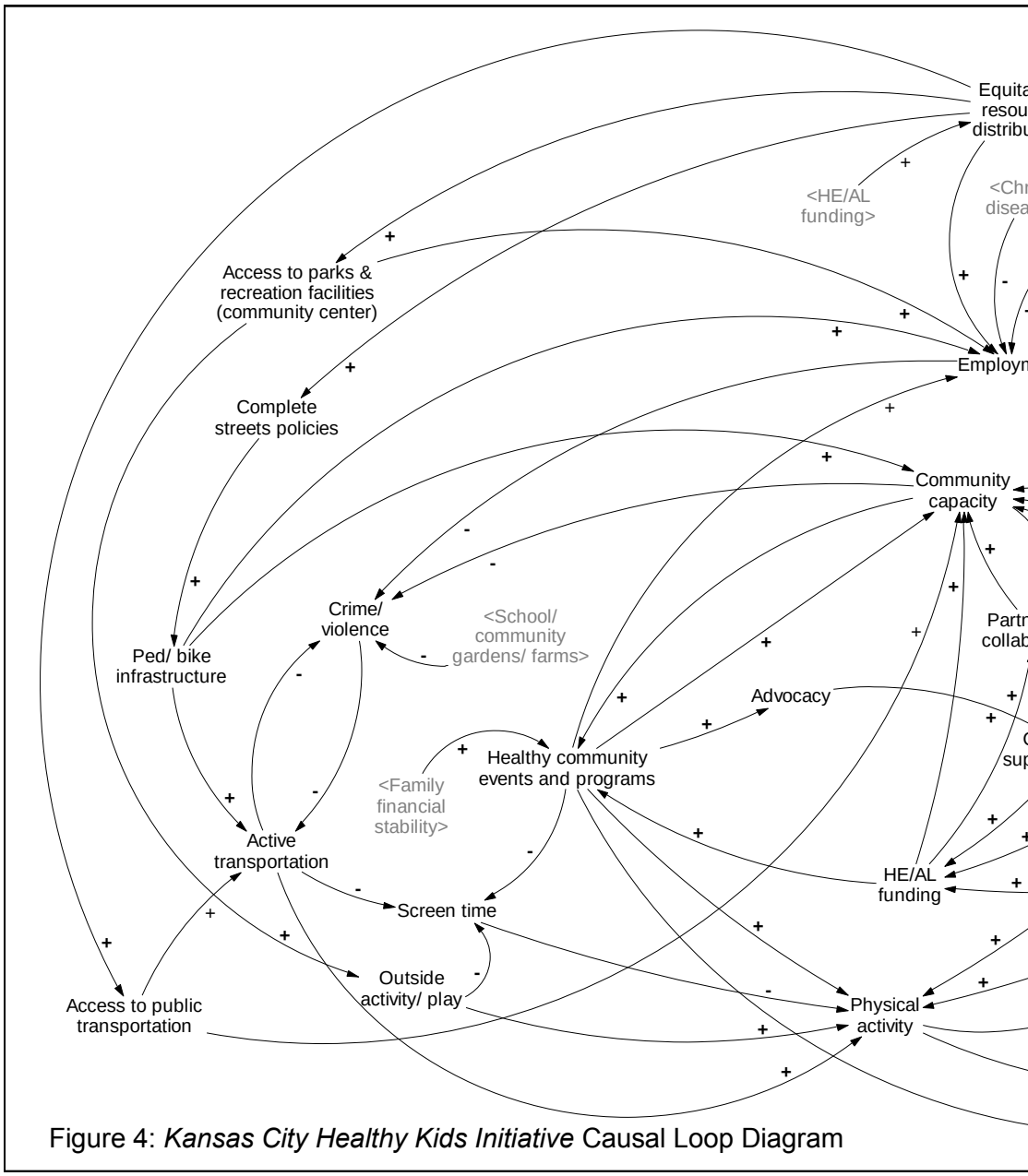


Figure 4: *Kansas City Healthy Kids Initiative* Causal Loop Diagram

This causal loop diagram reflects a series of conversations among partners and residents from 2011 to 2013. Some discussions probed more deeply into different variables through the behavior over time graphs exercise, or causal relationships through the causal loop diagram exercise.

This represented a first attempt to collectively examine the range of things that affect or are affected by policy, system, and environmental changes in Kansas City, Missouri and Kansas to promote healthy eating and active living as well as preventing childhood overweight and obesity.

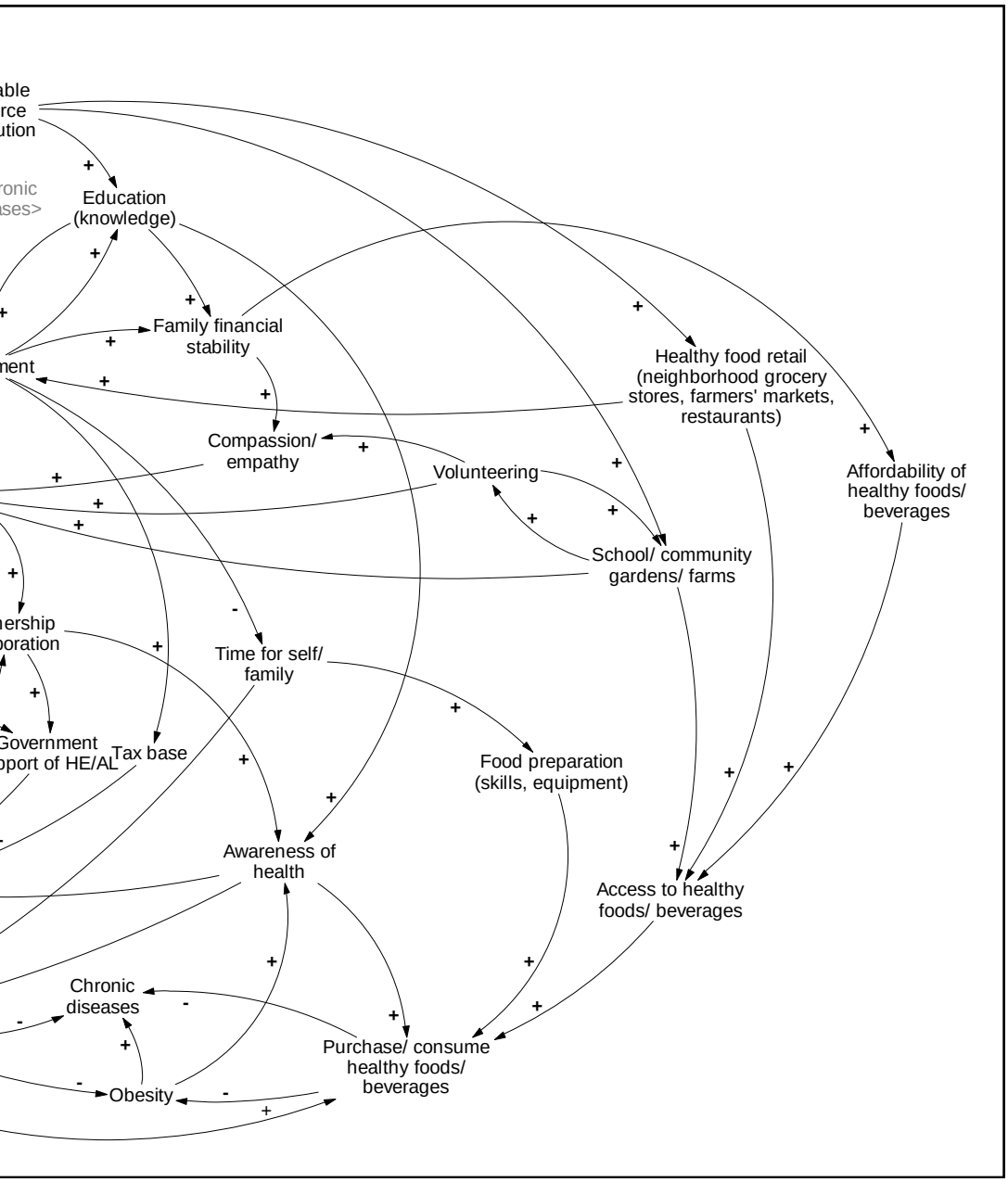
Yet, there are several limitations to this storybook, including:

- the participants represent a sample of the *Kansas City Healthy Kids Initiative* partners (organizations and residents) as opposed to a representative snapshot of government agencies, community organizations, businesses, and community residents;
- the behavior over time graphs and the causal loop diagram represent perceptions of the participants in these exercises (similar to a survey or an interview representing perceptions of the respondents);
- the exercises and associated dialogue took place in brief one- to two-hour sessions, compromising the group's capacity to spend too much time on any one variable, relationship, or feedback loop; and
- the responses represent a moment in time so the underlying structure of the diagram and the types of feedback represented may reflect "hot button" issues of the time.

Much work is yet to be done to ensure that this causal loop diagram is accurate and comprehensive, for

example:

- having conversations to discuss existing feedback loops to ensure that the appropriate variables and relationships are represented accurately;
- reviewing the behavior over time graphs (see also Appendix E) to confirm that the trends reflect common perceptions among residents and compare these trends to actual data;
- revisiting variables removed because they were not part of feedback loops, including: fast food restaurants; healthy foods/ beverages in school/after school programs (meals, fundraisers); car ownership/use; school PE; agribusiness & commodities; vacant lot redevelopment; structural racism; access to quality housing; engagement of young men; and
- starting new conversations about other variables (behavior over time graphs exercise) or relationships (causal loop diagram exercise) to add to this diagram.



In addition, different subgroups in Kansas City may use this causal loop diagram to delve in deeper into some of the subsectors (e.g., healthy eating, active living) or feedback loops, creating new, more focused causal loop diagrams with more specific variables and causal relationships.

Use of more advanced systems science methods and analytic approaches to create computer simulation models is another way to take this early work to the next level. The references section includes citations for resources on these methods and analytic approaches, and it is necessary to engage professional systems scientists in these activities.

Please refer to the Appendices for more information, including:

- Appendix A: Behavior over time graphs generated during site visit
- Appendix B: Photograph of the original version of the *Kansas City Healthy Kids Initiative* Causal Loop Diagram
- Appendix C: Original translation of the causal loop diagram into Vensim PLE
- Appendix D: Transcript translation of the causal loop diagram into Vensim PLE
- Appendix E: Behavior over time graphs not represented in the storybook

References for Systems Thinking in Communities:

Group model building handbook:
Hovmand, P., Brennan L., & Kemner, A. (2013). Healthy Kids, Healthy Communities Group Model Building Facilitation Handbook. Retrieved from http://www.transtria.com/hkhc.

Vensim PLE software for causal loop diagram creation and modification:
Ventana Systems. (2010). Vensim Personal Learning Edition (Version 5.11A) [Software]. Available from http://vensim.com/vensim-personal-learning-edition/

System dynamics modeling resources and support:
Andersen, D. F. and G. P. Richardson (1997). "Scripts for group model building." System Dynamics Review 13(2): 107-129.

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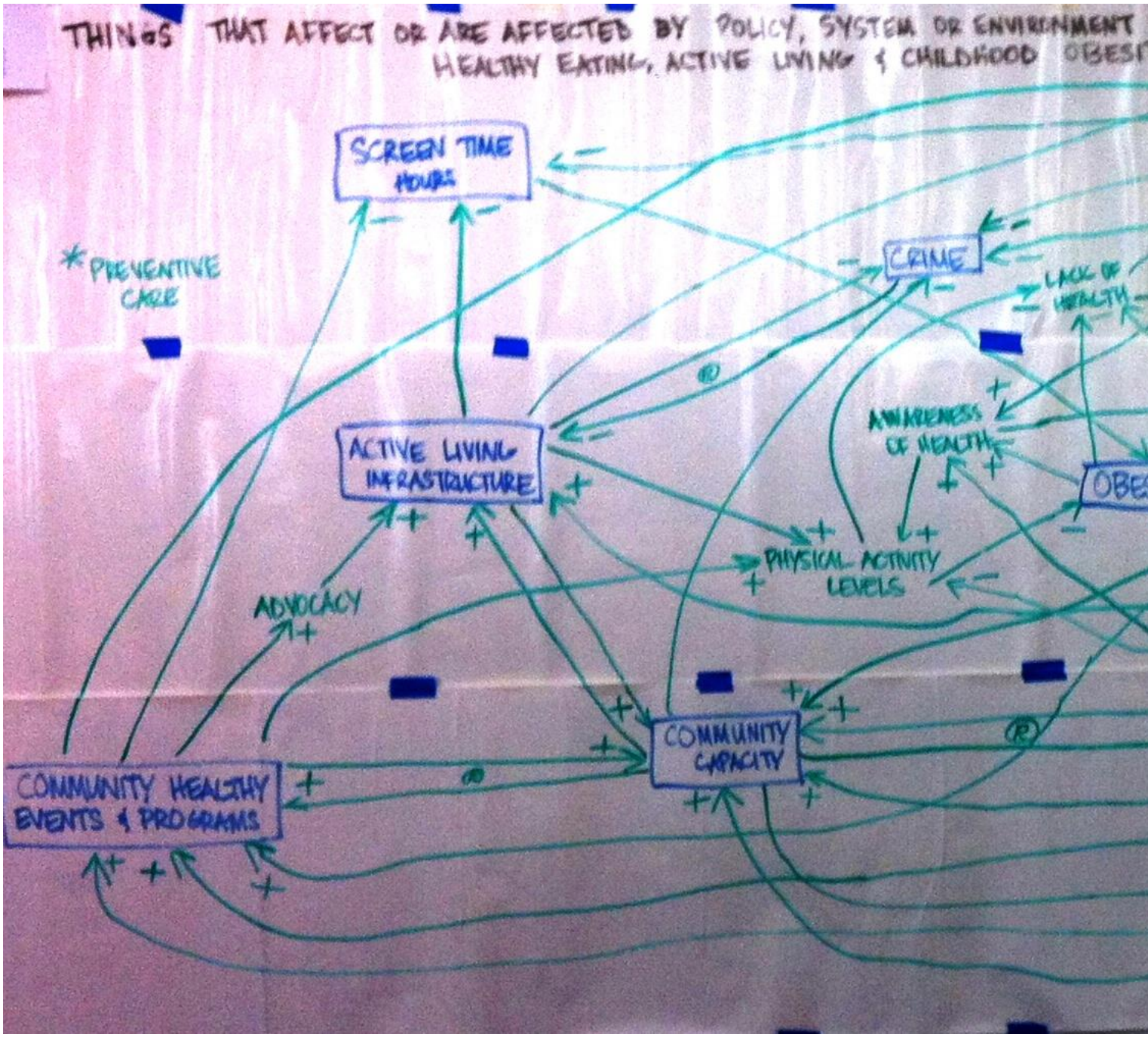
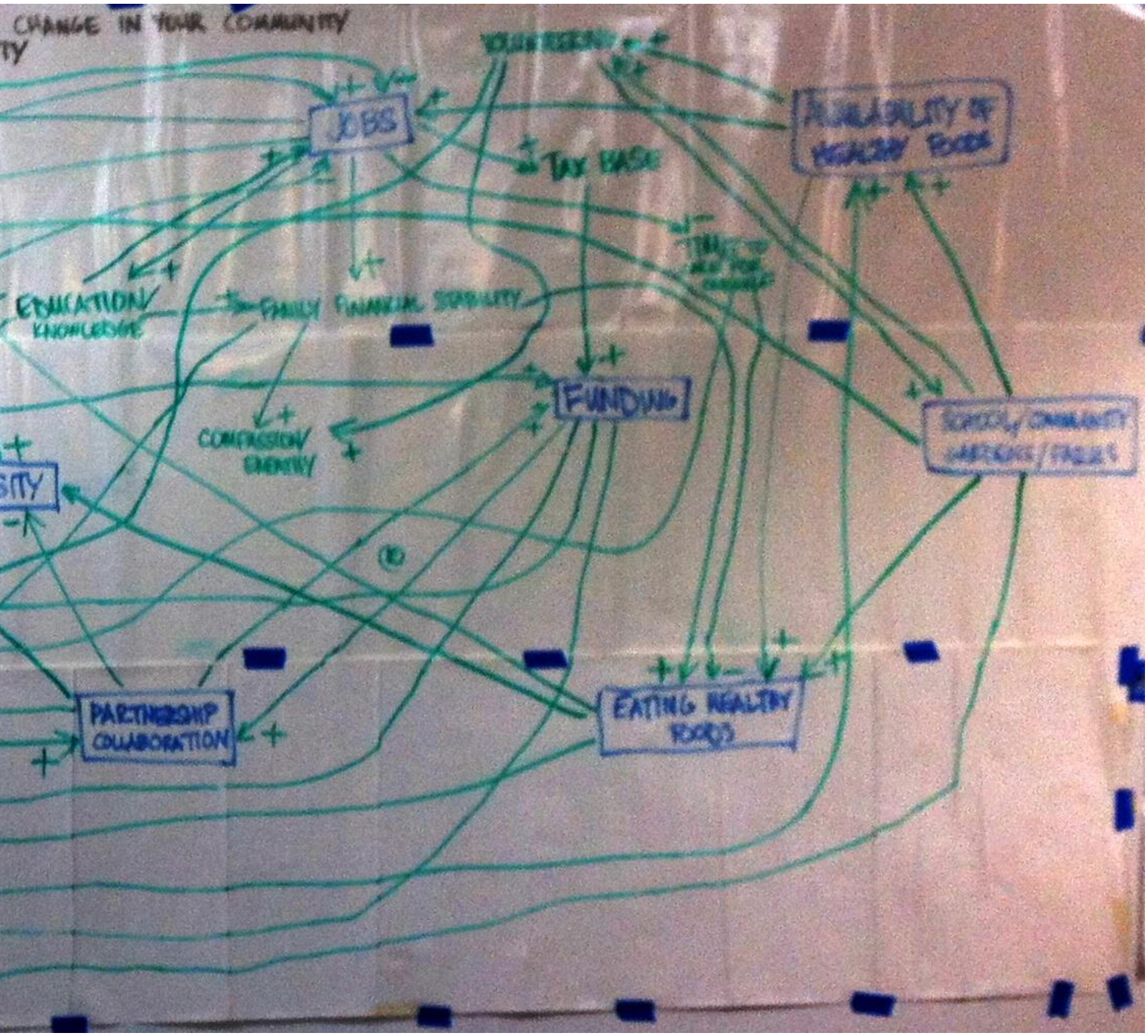
Appendix A: Behavior Over Time Graphs Generated during Site Visit

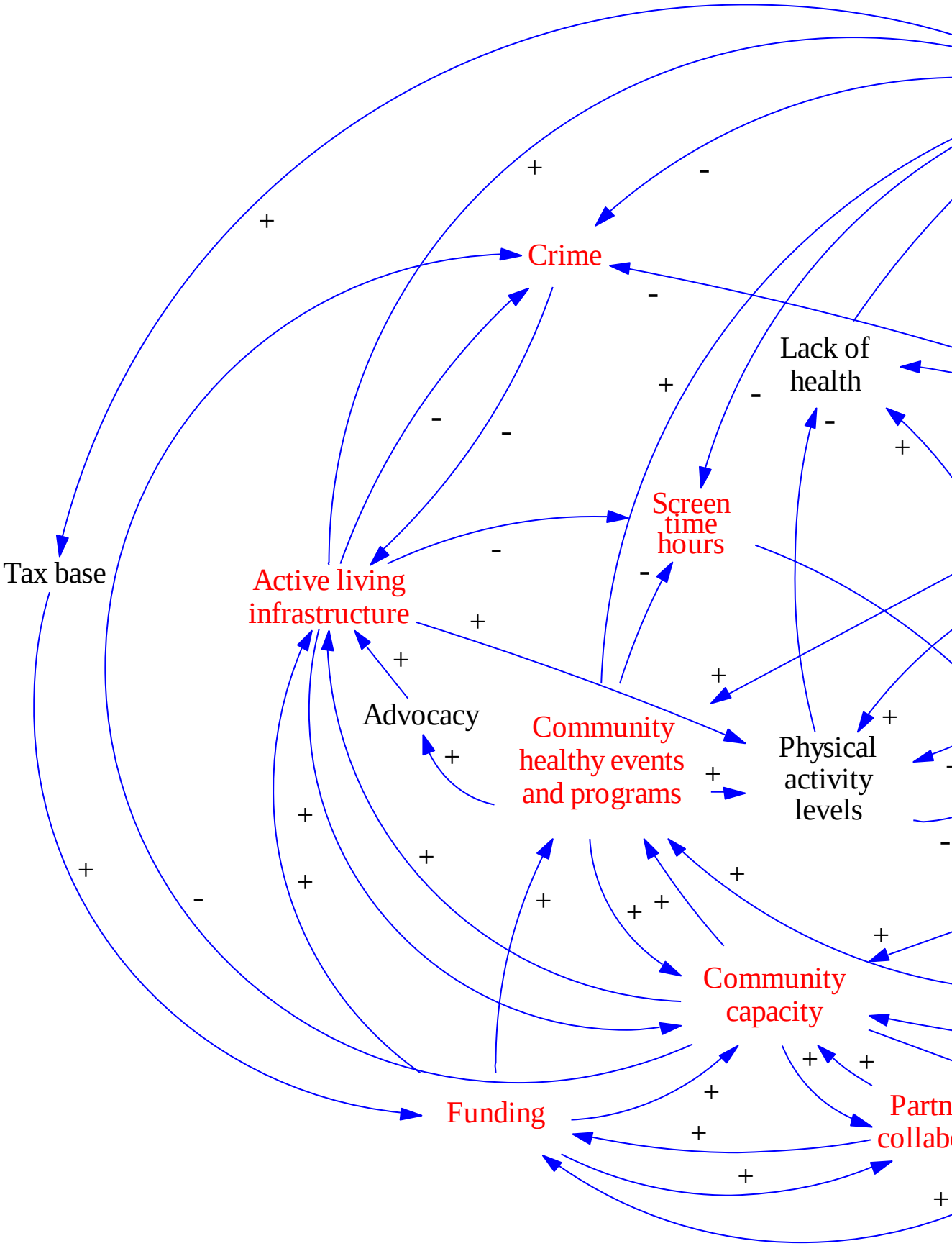
Community: *Kansas City Healthy Kids Initiative*	
Categories	**Number of Graphs**
Active Living Behavior	2
Active Living Environments	5
Funding	2
Healthy Eating Behavior	1
Healthy Eating Environments	9
Marketing and Media Coverage	0
Obesity and Long Term Outcomes	2
Partnership & Community Capacity	4
Policies	1
Programs & Promotions (Education and Awareness)	7
Social Determinants of Health	7
Total Graphs	**40**

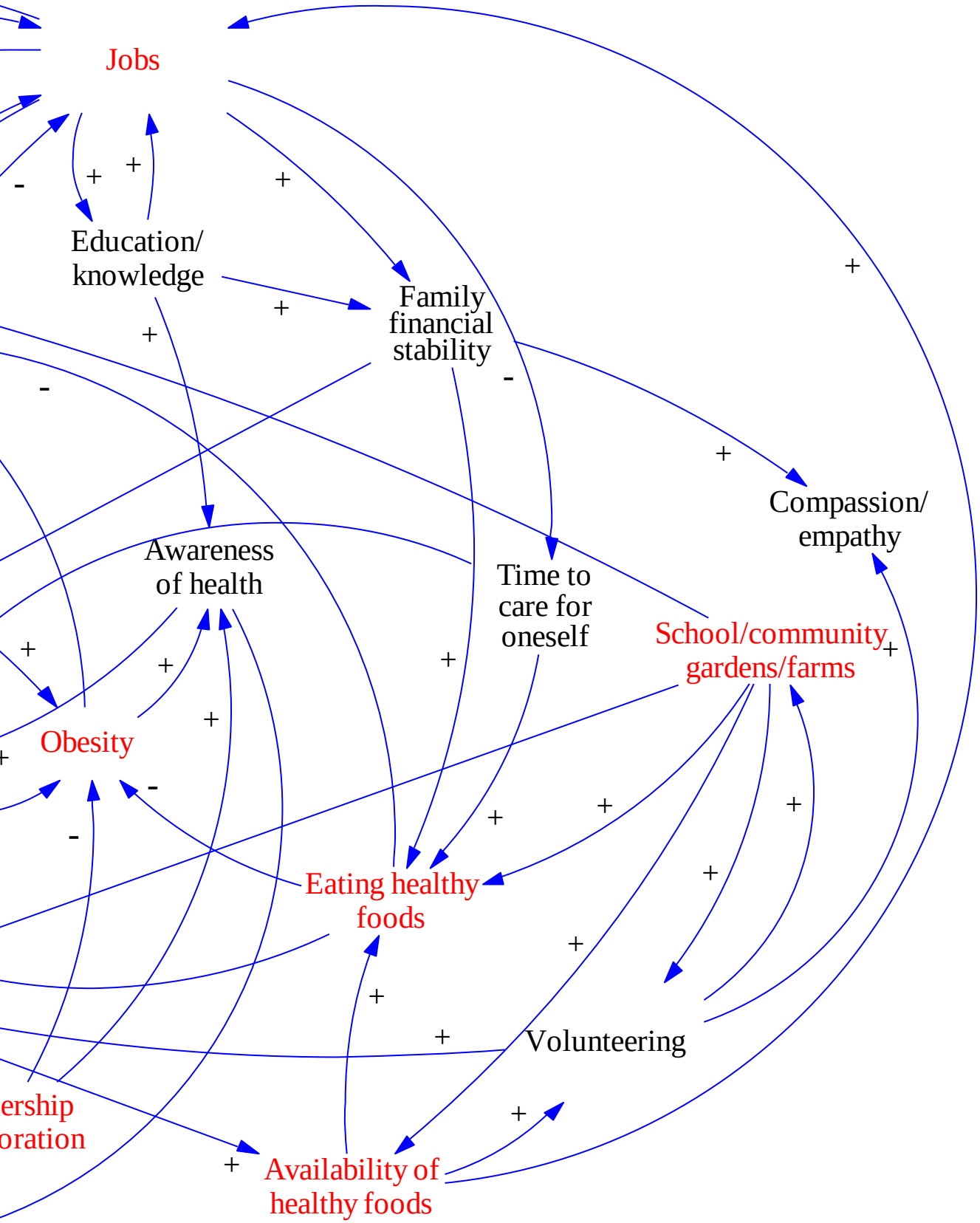
Appendix B: Photograph of the Original Version of the *Kansas City Healthy Kids Initiative* Causal



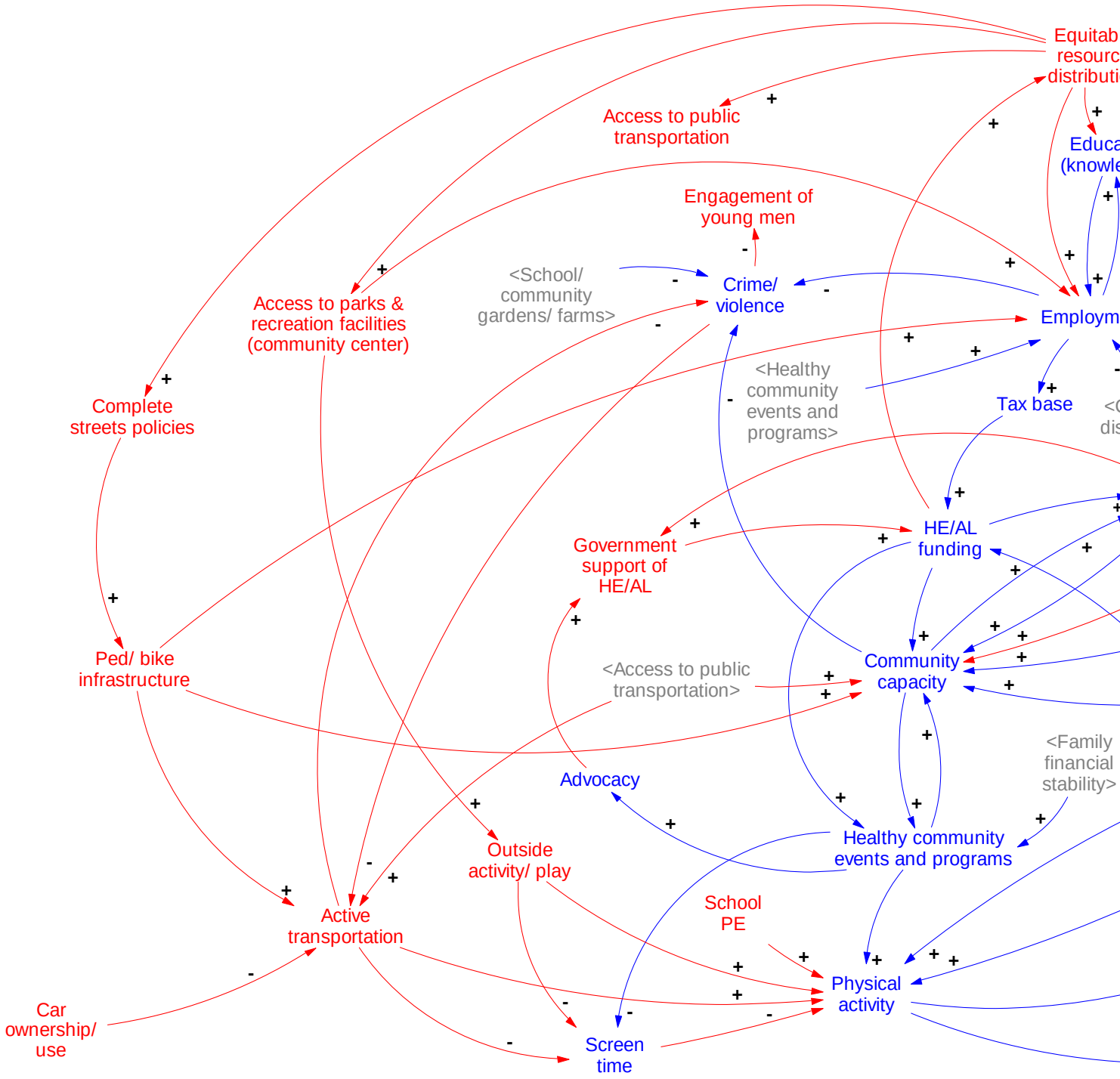

CHANGE IN YOUR COMMUNITY
JOBS
TAX BASE
EDUCATION/
KNOWLEDGE
FAMILY FINANCIAL STABILITY
FUNDING
COMMISSION/
ENERGY
PARTNERSHIP
COLLABORATION
EATING HEALTHY

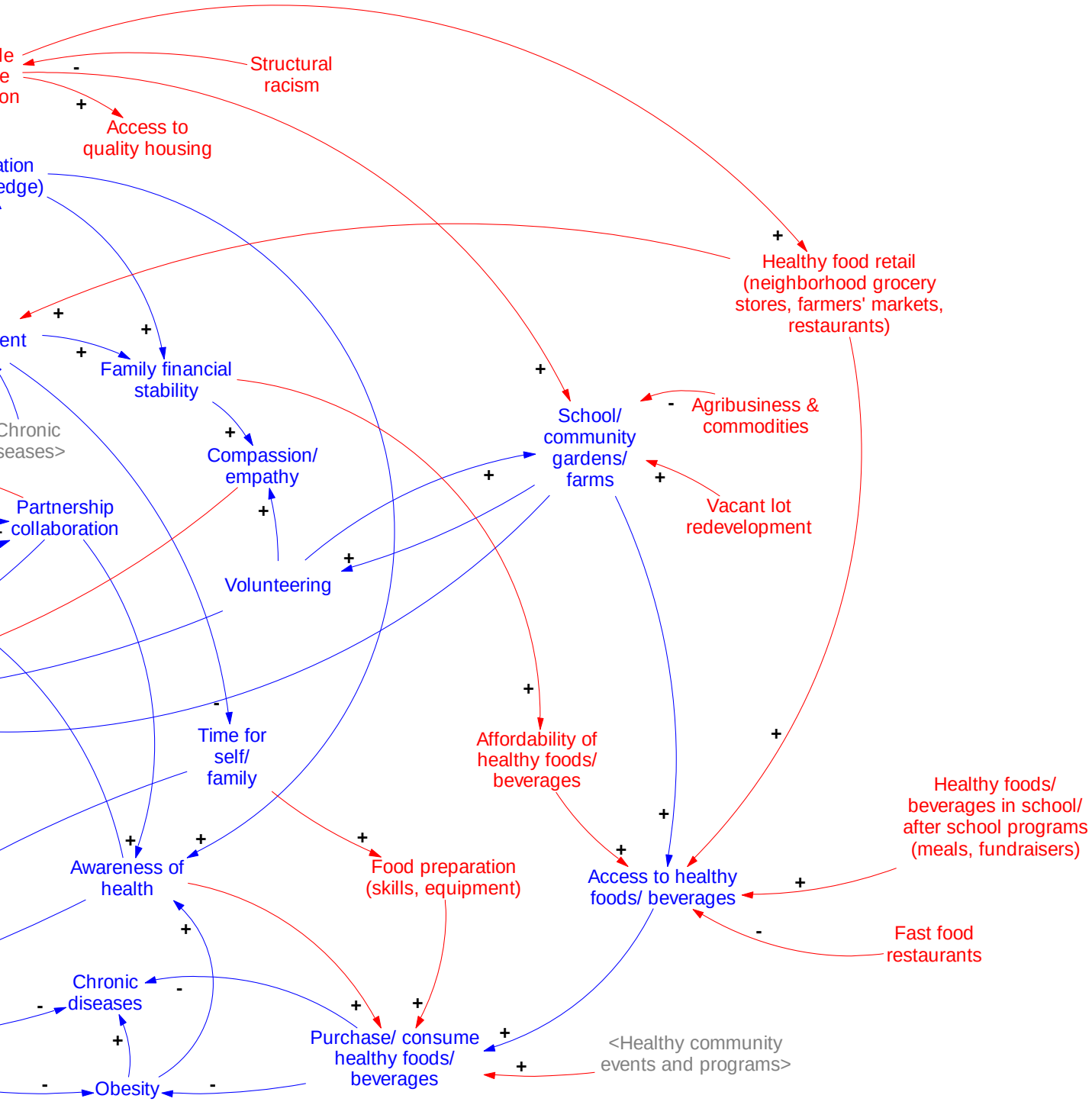
Appendix C: Original Translation of the Causal Loop Diagram into Vensim PLE



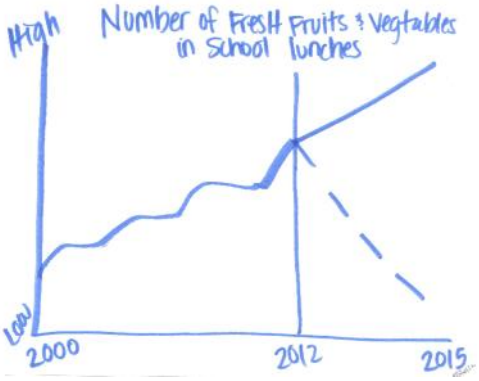

Jobs
Education/
knowledge
Family
financial
stability
Compassion/
empathy
Awareness
of health
Time to
care for
oneself
School/community
gardens/farms
Obesity
Eating healthy
foods
Volunteering
Availability of
healthy foods
+
-

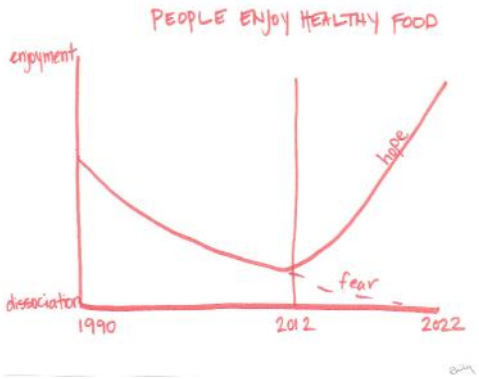
Appendix D: Transcript Translation of the Causal Loop Diagram into Vensim PLE

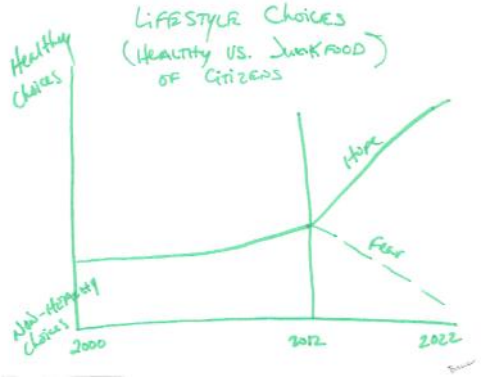


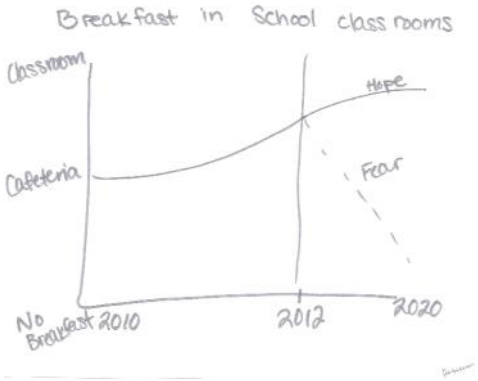

Structural racism
Access to quality housing
Healthy food retail (neighborhood grocery stores, farmers' markets, restaurants)
Family financial stability
Agribusiness & commodities
School/ community gardens/ farms
Compassion/ empathy
Vacant lot redevelopment
Partnership collaboration
Volunteering
Time for self/ family
Affordability of healthy foods/ beverages
Healthy foods/ beverages in school/ after school programs (meals, fundraisers)
Awareness of health
Food preparation (skills, equipment)
Access to healthy foods/ beverages
Fast food restaurants
Chronic diseases
Purchase/ consume healthy foods/ beverages
<Healthy community events and programs>
Obesity

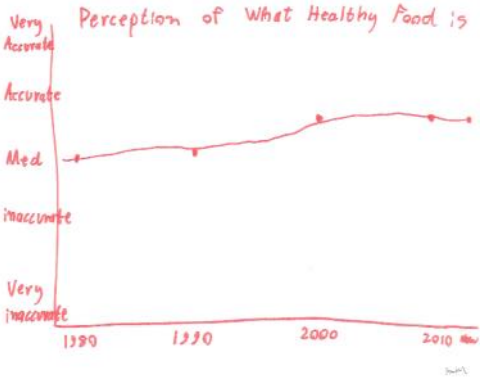
Appendix E: Behavior Over Time Graphs not Represented in the Storybook

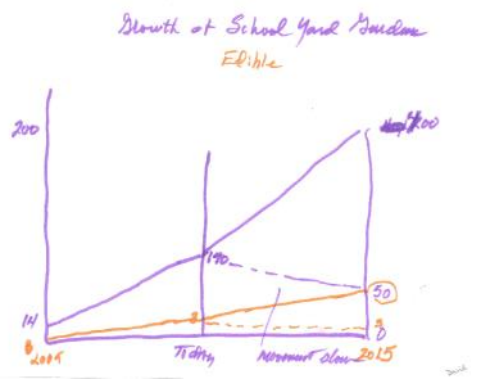


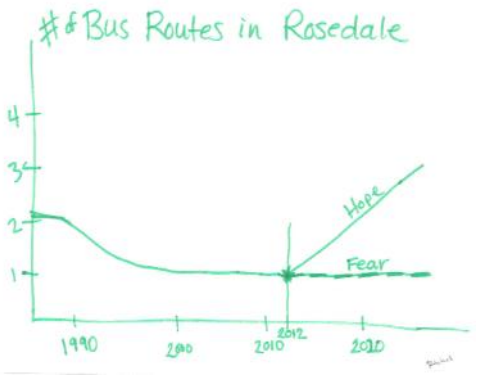


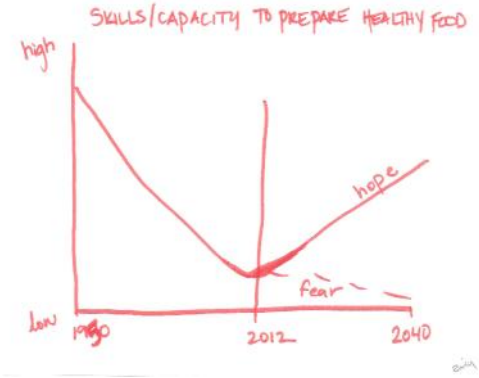


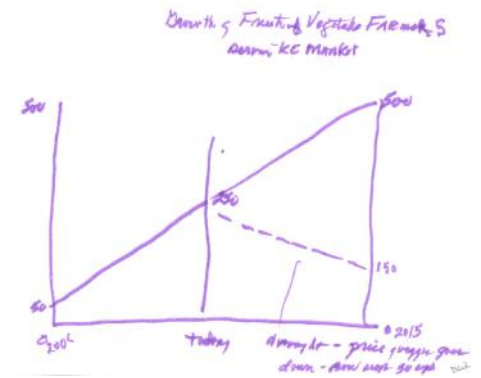


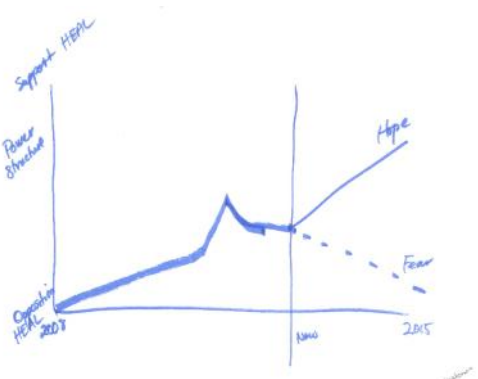


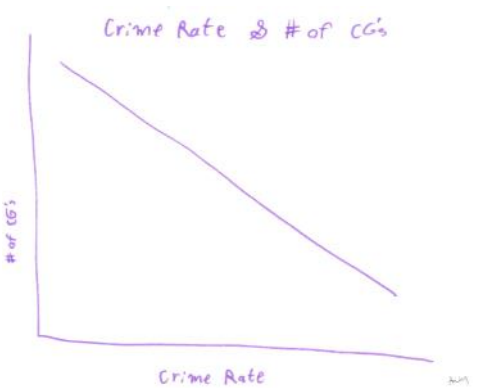


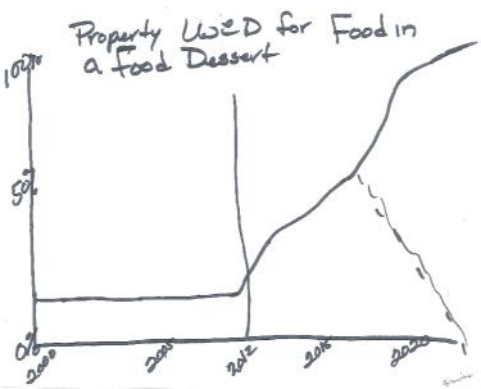


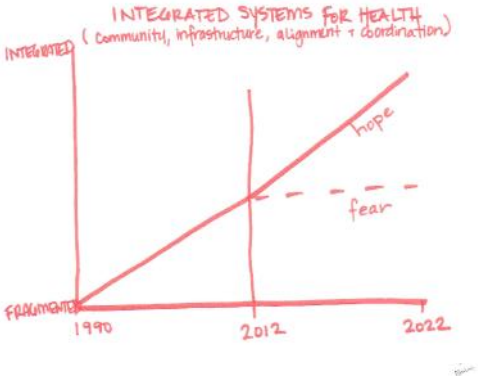


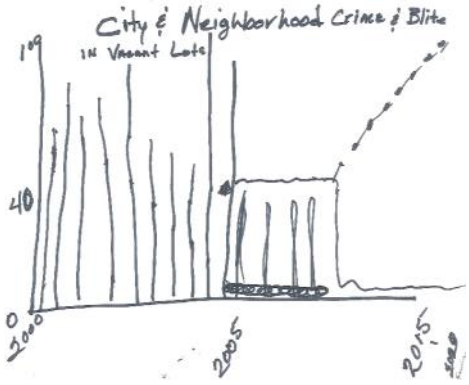


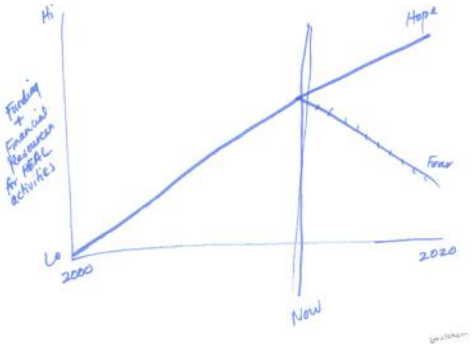


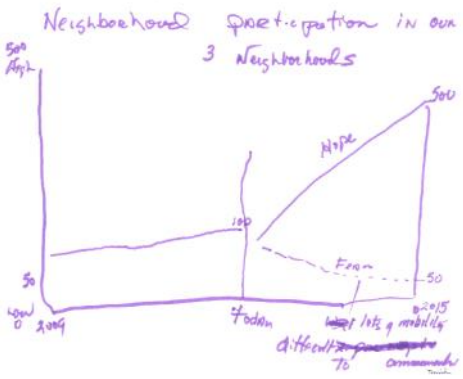


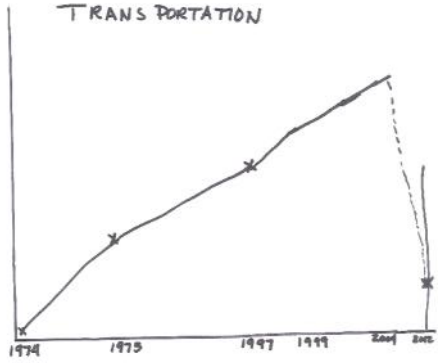


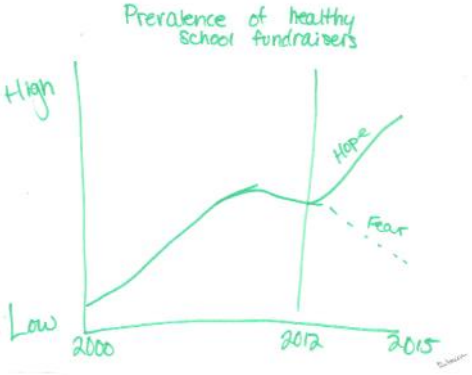

INTEGRATED SYSTEMS FOR HEALTH
(community, infrastructure, alignment + coordination)
INTEGRATED
FRAGMENTED
hope
fear
1990
2012
2022

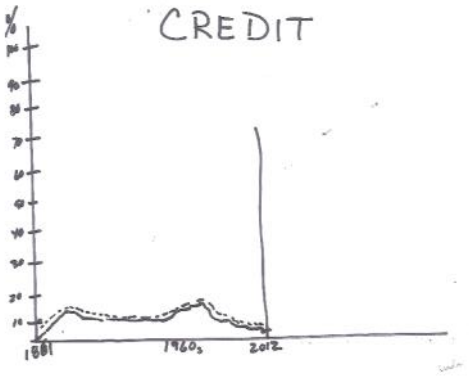

City & Neighborhood Crime & Blite
IN Vacant Lots
100
40
0
2000
2005
2015

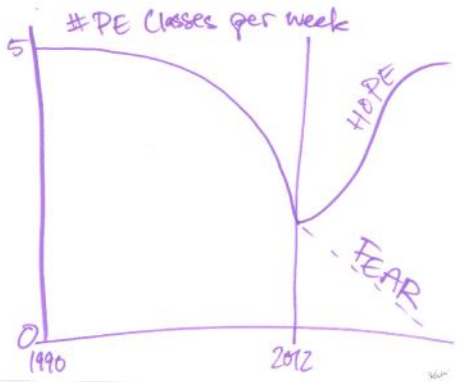

Hi
Lo
Funding + Financial Resources for HEAL activities
Hope
Fear
2000
2020
Now

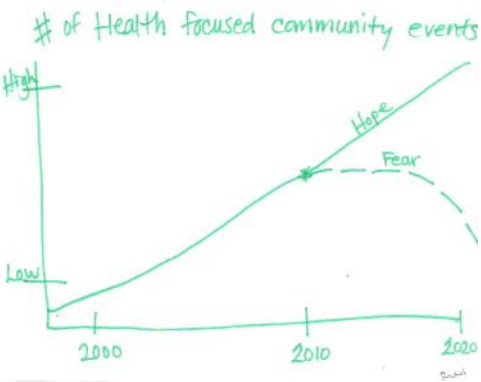

Neighborhood participation in our 3 Neighborhoods
500
Hope
100
Fear
50
Today
2015

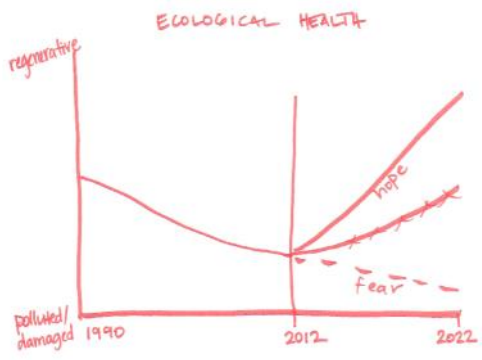

TRANSPORTATION
1974
1975
1997
1999

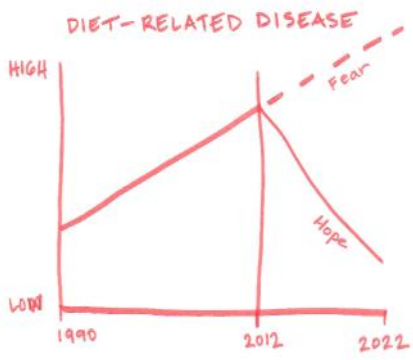

Prevalence of healthy school fundraisers
High
Low
Hope
Fear
2000
2012
2015

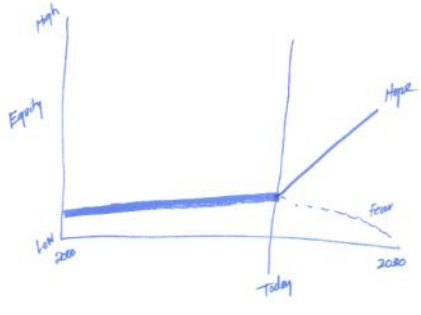

CREDIT
1881
1960s
2012

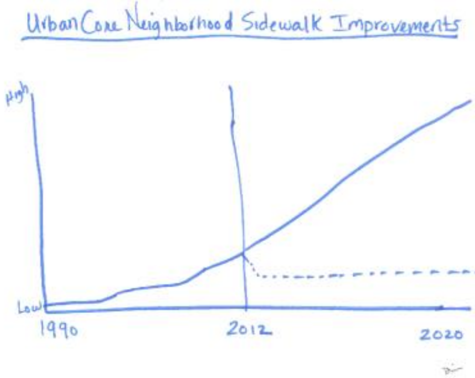

PE Classes per week
5
0
HOPE
FEAR
1990
2012

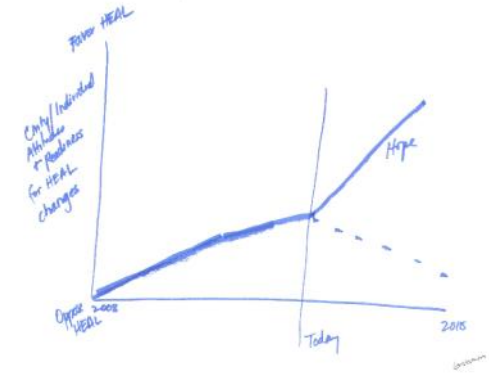

# of Health focused community events
High
Low
Hope
Fear
2000
2010
2020

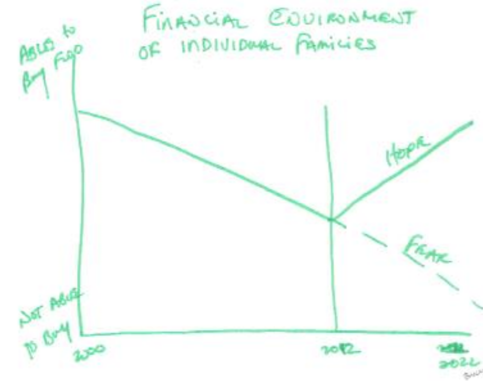

ECOLOGICAL HEALTH
regenerative
polluted/ damaged
hope
fear
1990
2012
2022

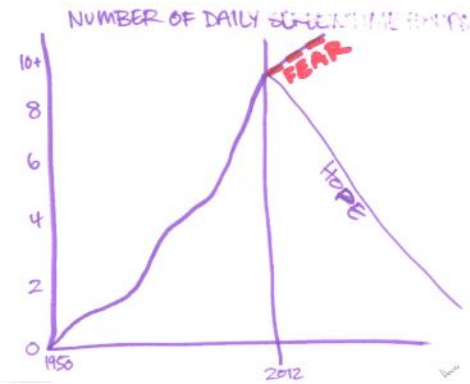

DIET-RELATED DISEASE
HIGH
LOW
Fear
Hope
1990
2012
2022

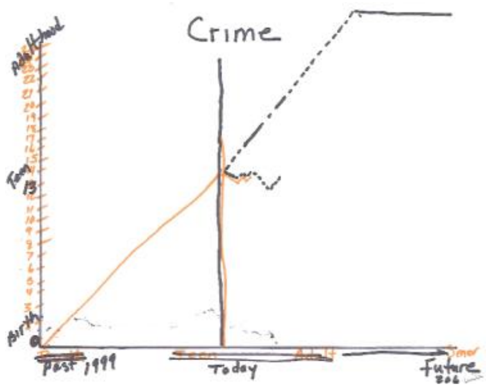

High
Equity
Low
Hope
Fear
2000
Today
2020


Urban Core Neighborhood Sidewalk Improvements
High
Low
1990
2012
2020

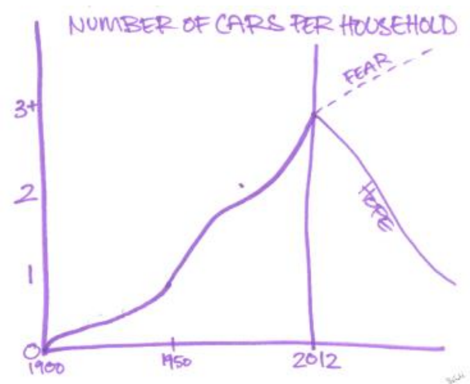

Favor HEAL
Oppose HEAL
2008
Today
2018
Hope

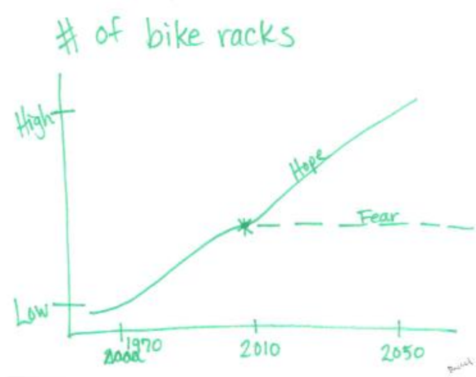

FINANCIAL ENVIRONMENT
OF INDIVIDUAL FAMILIES
ABLE to Buy Food
NOT ABLE to Buy
2000
2012
2022
Hope
FEAR

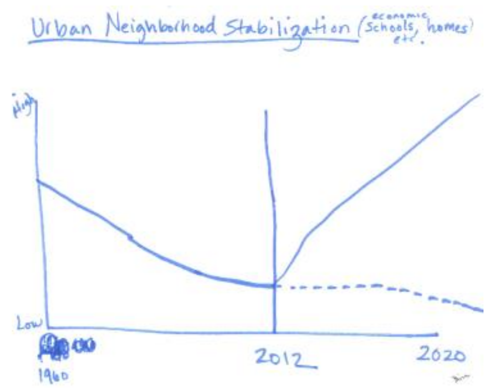

NUMBER OF DAILY
10+
8
6
4
2
0
1950
2012
FEAR
HOPE


Crime
Adulthood
Teen
Birth
Past 1999
Today
Future


Jobs in the City
100%
50%
0%
1996
2000


NUMBER OF CARS PER HOUSEHOLD
3+
2
1
0
1900
1950
2012
FEAR
HOPE


# of bike racks
High
Low
1970
2010
2050
Hope
Fear


Urban Neighborhood Stabilization (economic, schools, homes etc.)
High
Low
1960
2012
2020