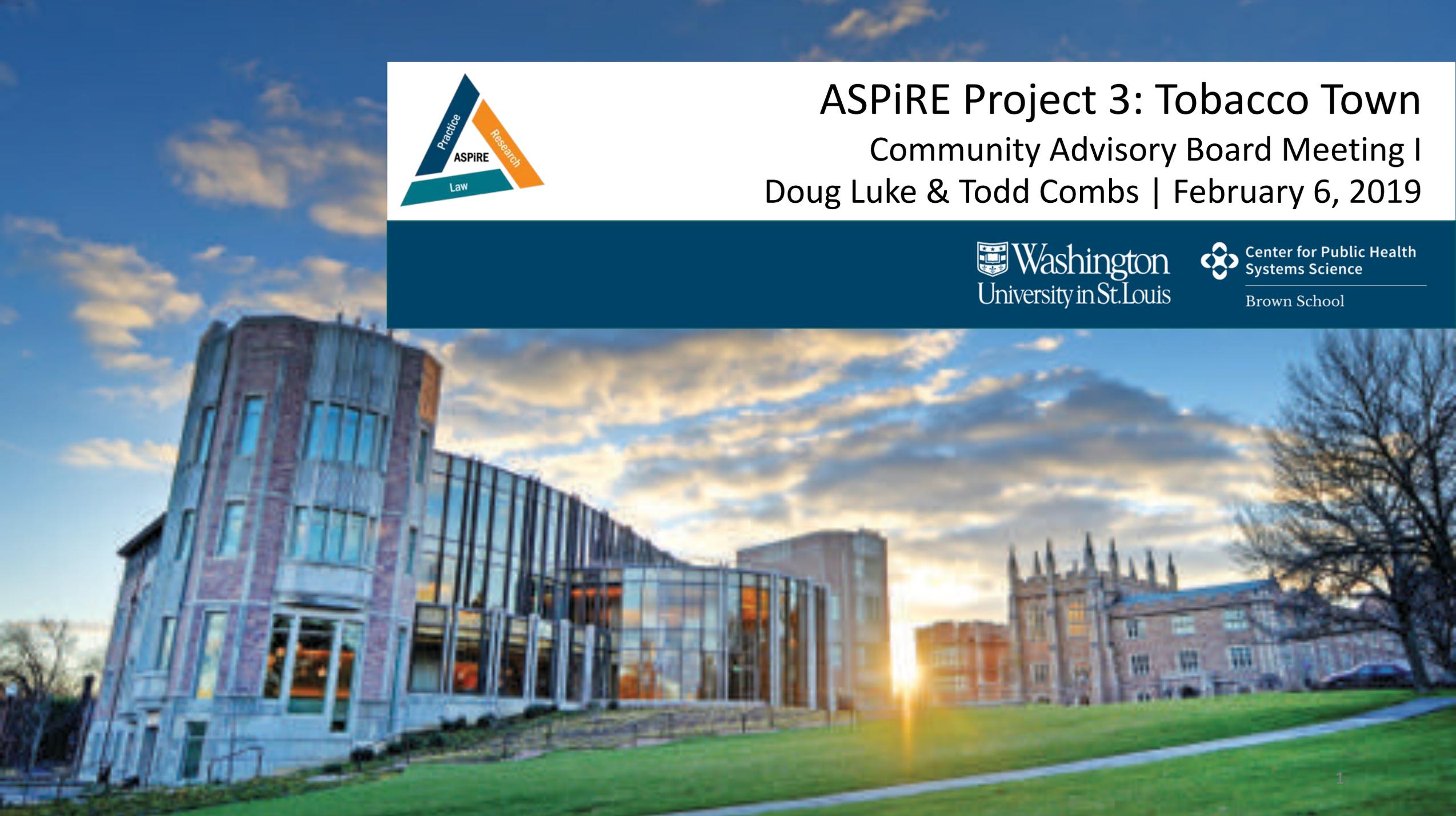




ASPIRE Project 3: Tobacco Town

Community Advisory Board Meeting I

Doug Luke & Todd Combs | February 6, 2019



What is Tobacco Town, a.k.a Project 3?

- Recognize the challenges of studying retail tobacco policies and their impact in the real world
- Using agent-based modeling we can study how policies may influence
 - The built environment (retailer density)
 - The consumer environment (inside stores)
 - And how they affect tobacco purchase & use behaviors



Project 3 Tobacco Town

- What is Agent-Based Modeling (ABM)?
- How is retailer density and product availability related to cost?
- Tobacco Town Project overview
- How to maximize usefulness & impact



What is agent-based modeling?

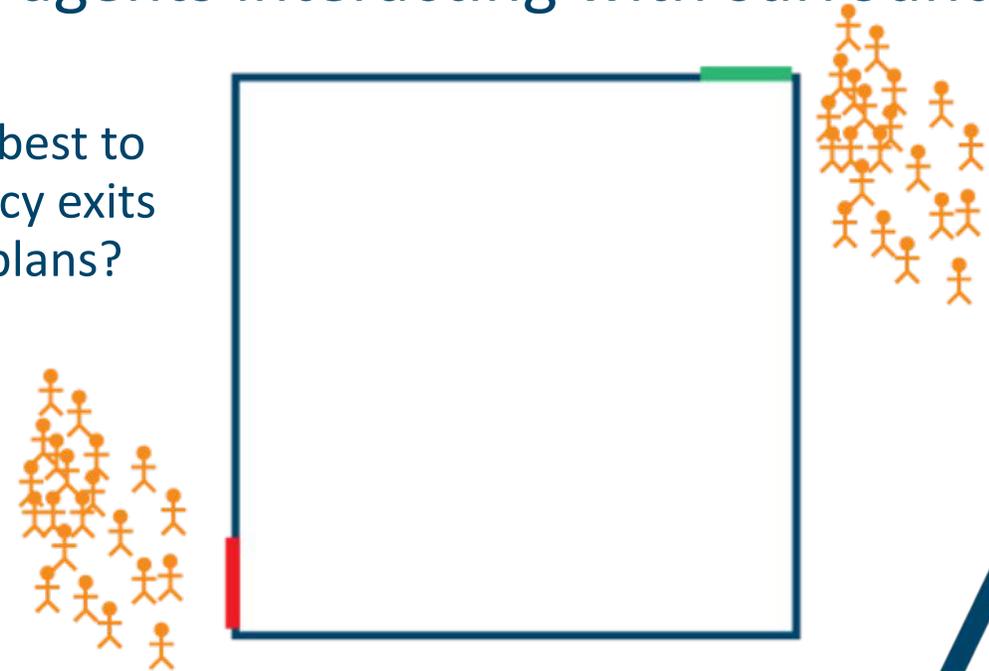
ABM Overview

- Computational model
 - Built from the bottom up using *agents, their behaviors & the environment*
- Virtual society: complex system of agents interacting with surroundings



KEY:  = agent  = Emergency exit  = Entrance/exit

Example: How best to design emergency exits & evacuation plans?



KEY:  = agent  = Emergency exit  = Entrance/exit

ABM: Evacuation example

- Building planning for evacuation
- Initial plan
 - 2 exits
 - Signs
- What are we assuming?



- ASSUMPTION

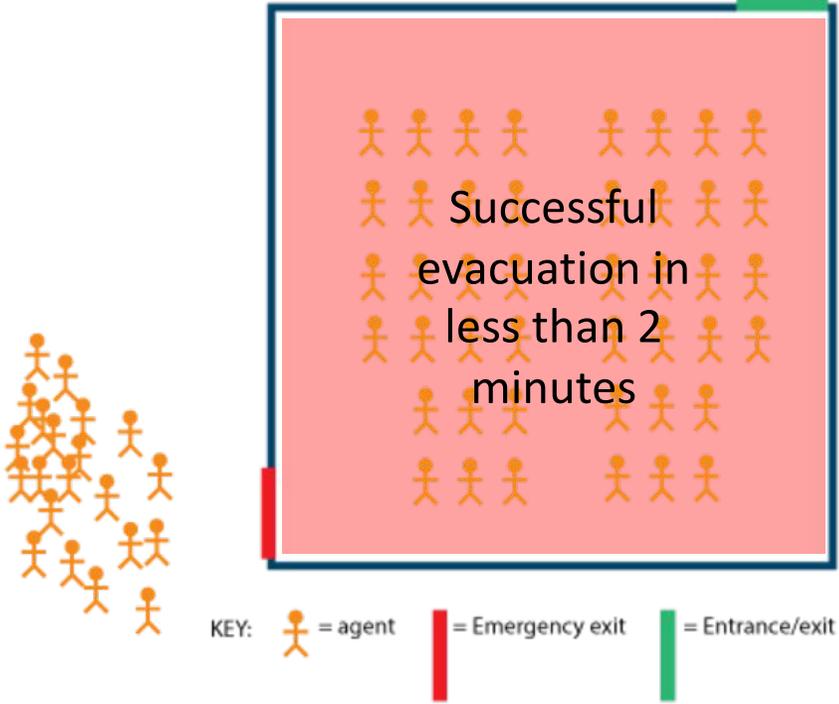
- Everyone knows closest exit, in front of & behind them



In an **EMERGENCY**, please exit through the closest exit

ABM: Evacuation example

- Building planning for evacuation
- Initial plan
 - 2 exits
 - Signs



In an **EMERGENCY**, please exit through the closest exit. PLEASE look in front of and BEHIND YOU.



ABM: Affirmative Action policies

- What levels of *racial* diversity can be achieved with *socioeconomic-based* affirmative action policies?
- ABM testing race-based affirmative action admission policies v.
 - SES-based affirmative action policy
 - Race-based application & recruitment policy
- Results suggested that racial diversity might be achieved through purely SES-based admission policies
- Model results featured in **SCOTUS amicus brief** submitted for *Fisher v. University of Texas at Austin 2016*
- Matt Kasman, Co-Investigator for Project 3 Tobacco Town



ABM: Affirmative Action findings

- Policies do not affect *who* goes to college, just *where*
- Race-neutral affirmative action policies may achieve current levels of racial diversity, but a *strong combination of policies* is needed
- Policy effects depend on *context* (elite v. second-tier, for example)
- Policy *spillover* happens: one college's policy can affect enrollment elsewhere



Usefulness of ABM for tobacco control

- Use computational models when we cannot use real-world experiments
 - *Unethical to experiment on communities to study retail tobacco policy effects*
- Introduce change (shock) and examine changes in behavior & environment
 - *Restricting menthol sales or prohibiting coupons*
- Can expose gaps in existing data or surveillance systems
 - *How far are people willing to travel to purchase cigarettes?*
- Results of computational models are improved when based on data and scientific evidence
 - *For example, PATH, BRFSS, PUMS (Census)*

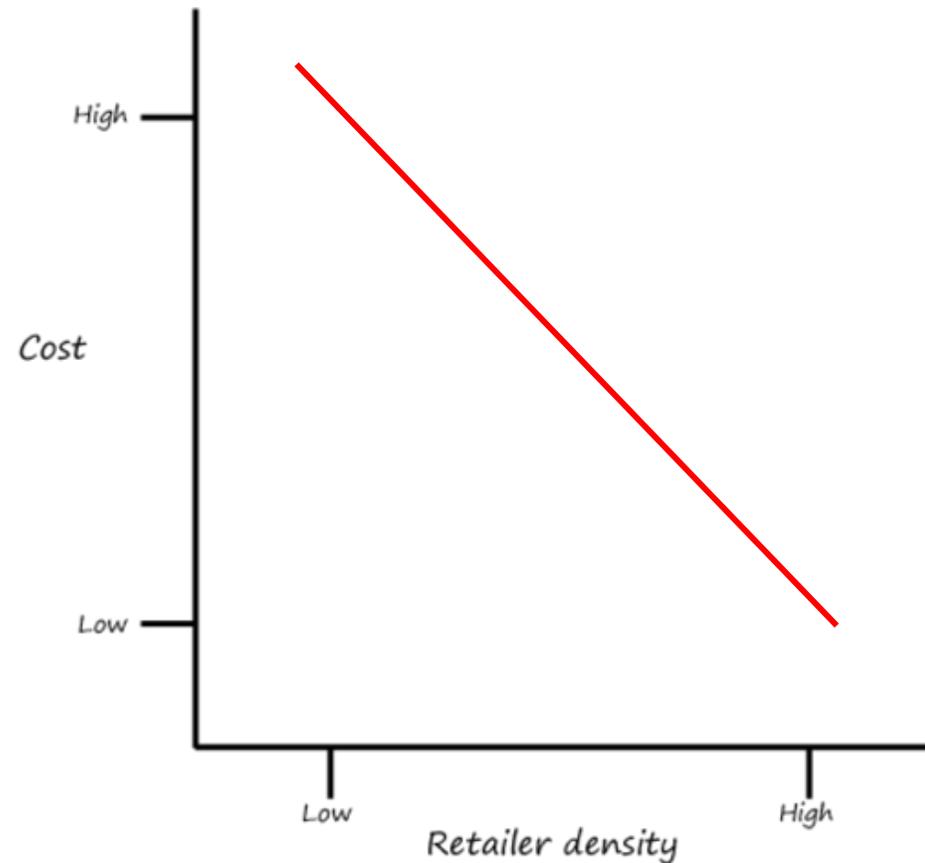


Why reduce retailer density?

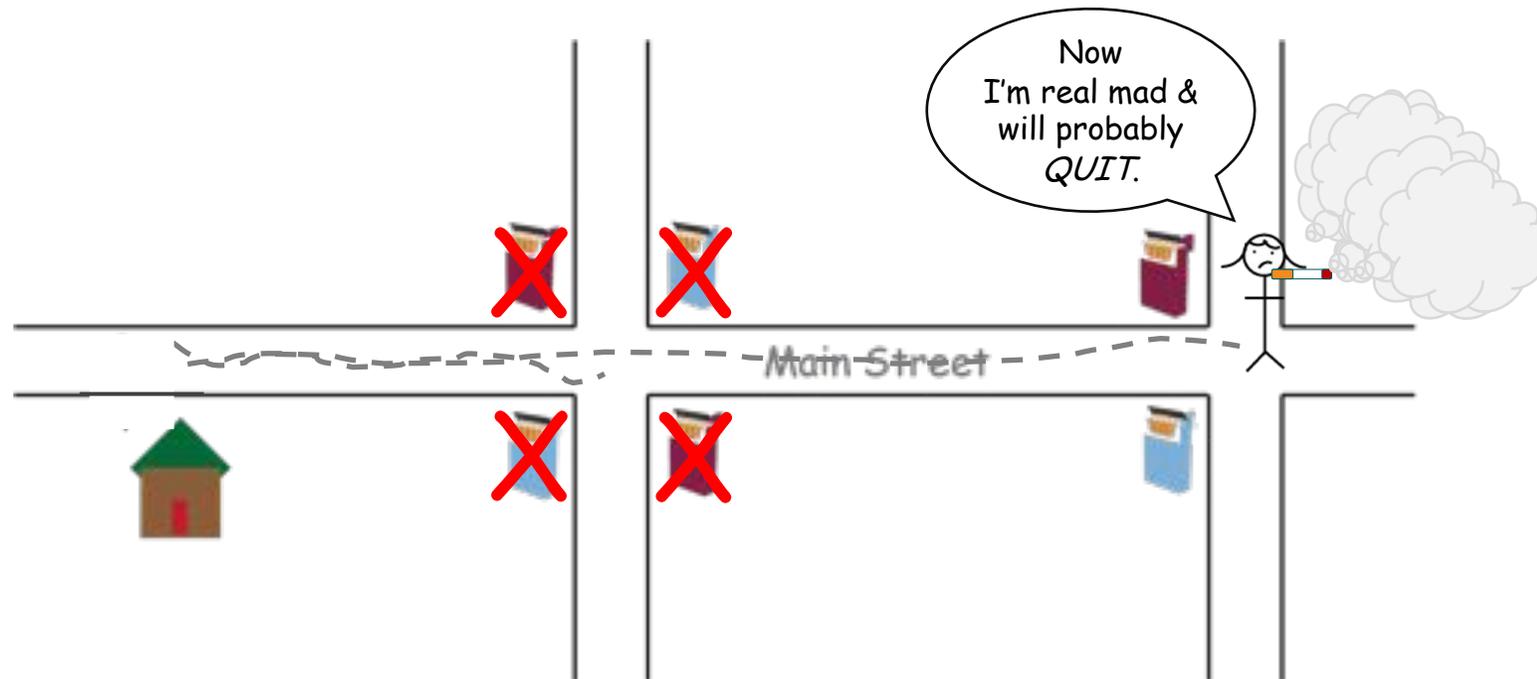
By how much? And how does this increase costs of getting tobacco products?

Thinking about retailer density & cost

- We would think...

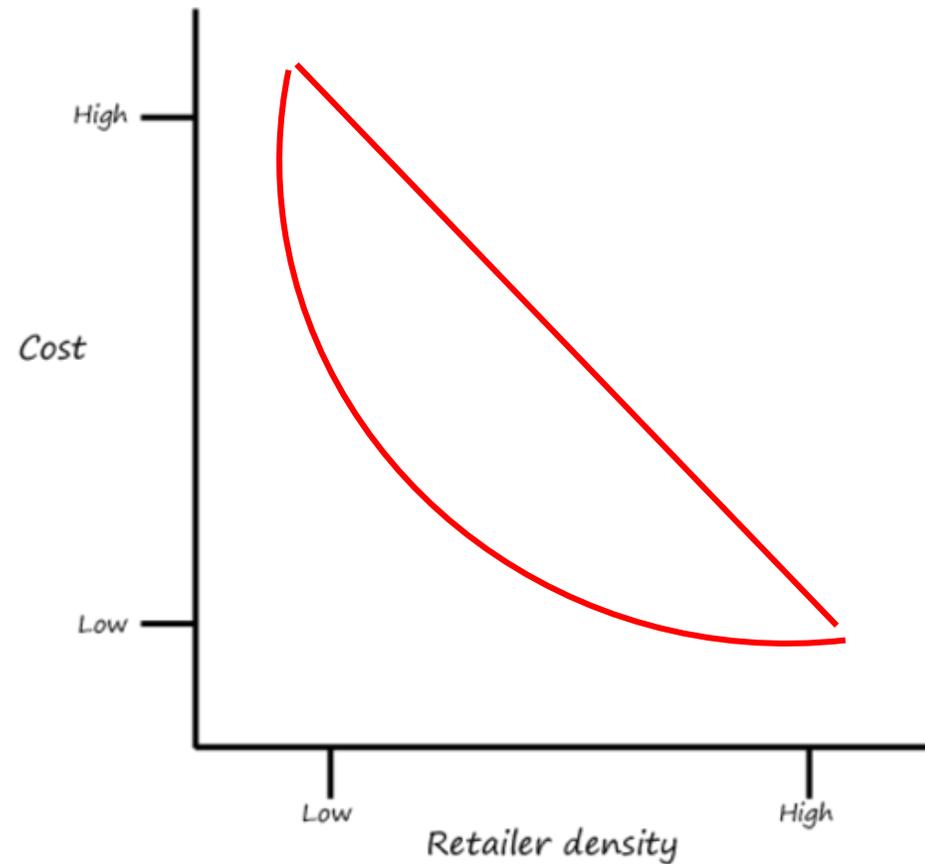


Thinking about retailer density & cost



Thinking about retailer density & cost

- So really...



Why reduce density & make cigarettes harder to get?

- **We know:**

- Increasing the costs of cigarettes lowers consumption (tax)¹
- Making it harder to smoke reduces initiation & deters relapse (smoke-free air laws)²

- **Retail-focused policies aim to:**

- *Make products harder to get*
 - Fewer and farther between
 - Prohibit certain products
- *Increase costs*
 - Direct: non-tax pricing policies
 - Indirect: increased travel time & distance, opportunity costs
- *Reduce use*
- *And, can be tailored to the individual characteristics of specific communities!*

1. Levy, D, Chaloupka, F & Gitchell, J. The Effects of Tobacco Control Policies on Smoking Rates: A Tobacco Control Scorecard. *JPHMP*. 2004;10. 338-53. 10.1097/00124784-200407000-00011.

2. Shang C. The effect of smoke-free air law in bars on smoking initiation and relapse among teenagers and young adults. *Int J Environ Res Public Health*. 2015;12(1):504-20. Published 2015 Jan 9. doi:10.3390/ijerph120100504



Tobacco Town

Project 3 Overview

Tobacco Town Conceptual Framework



Tobacco Town Conceptual Framework



Tobacco Town Conceptual Framework



Tobacco Town Conceptual Framework



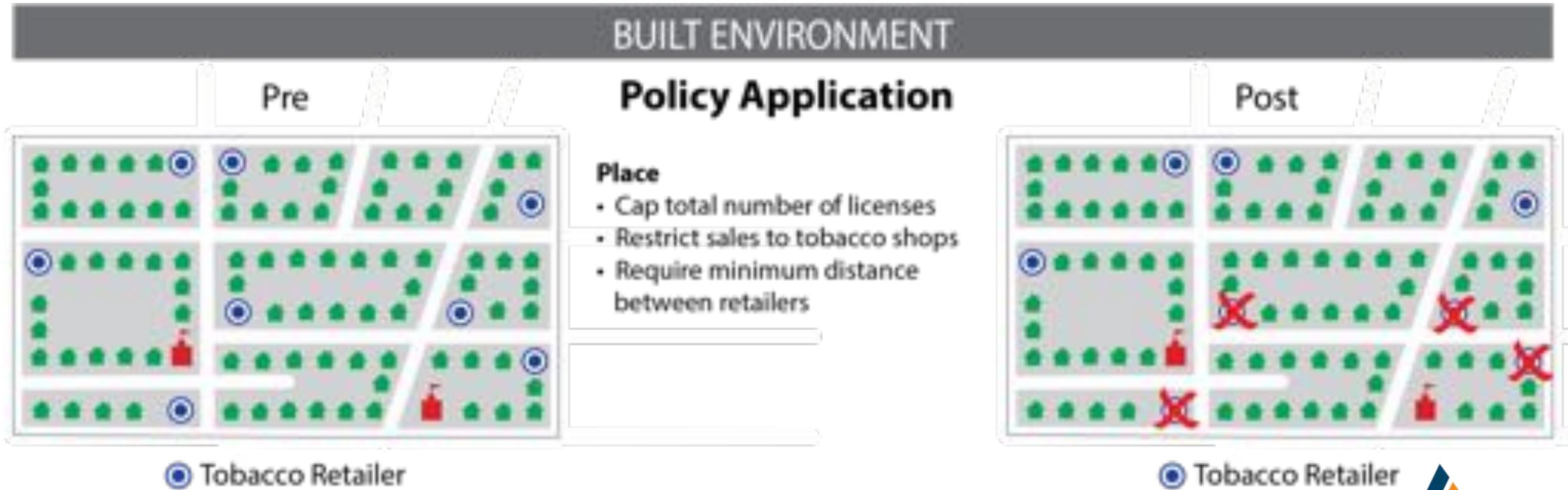
Tobacco Town

- Goals

- Develop an agent-based model
- Use it to examine the potential impact of retail tobacco policies
- Compare impact across different community contexts & populations
- Investigate underlying mechanisms and decision processes of tobacco purchase
- Tailor model to represent 6-8 CAB cities...



Example policies in Tobacco Town



Example policies in Tobacco Town

CONSUMER ENVIRONMENT

Pre



Policy Application

Price

- Establish minimum price and packaging laws
- Ban price discounting
- Ban coupon redemption

Product availability

- Restrict flavored products and menthol

Post



Some things we don't know yet...

- Consumer tobacco retailer preferences
 - When, where, & why?
- Consumer tobacco cost preferences & thresholds
 - Is price or convenience more important?
 - How much is *too* much? (cost, distance)
- So, we are collaborating on Big City Tobacco Control (Project 2) surveys



Building blocks of Tobacco Town

- Empirical data:
 - Population and demographics
 - Smoking characteristics
 - Retailers
 - Cigarette prices
- Economic and public health literature:
 - Decision-making
 - Price sensitivities

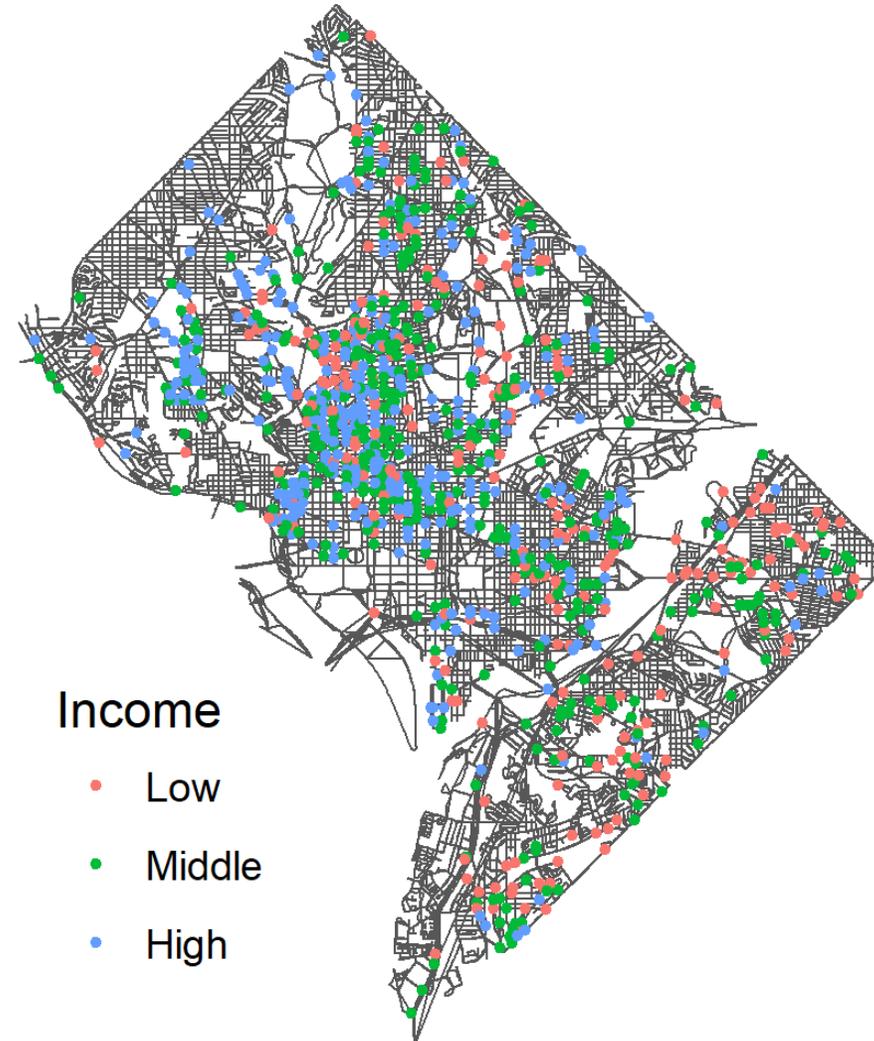
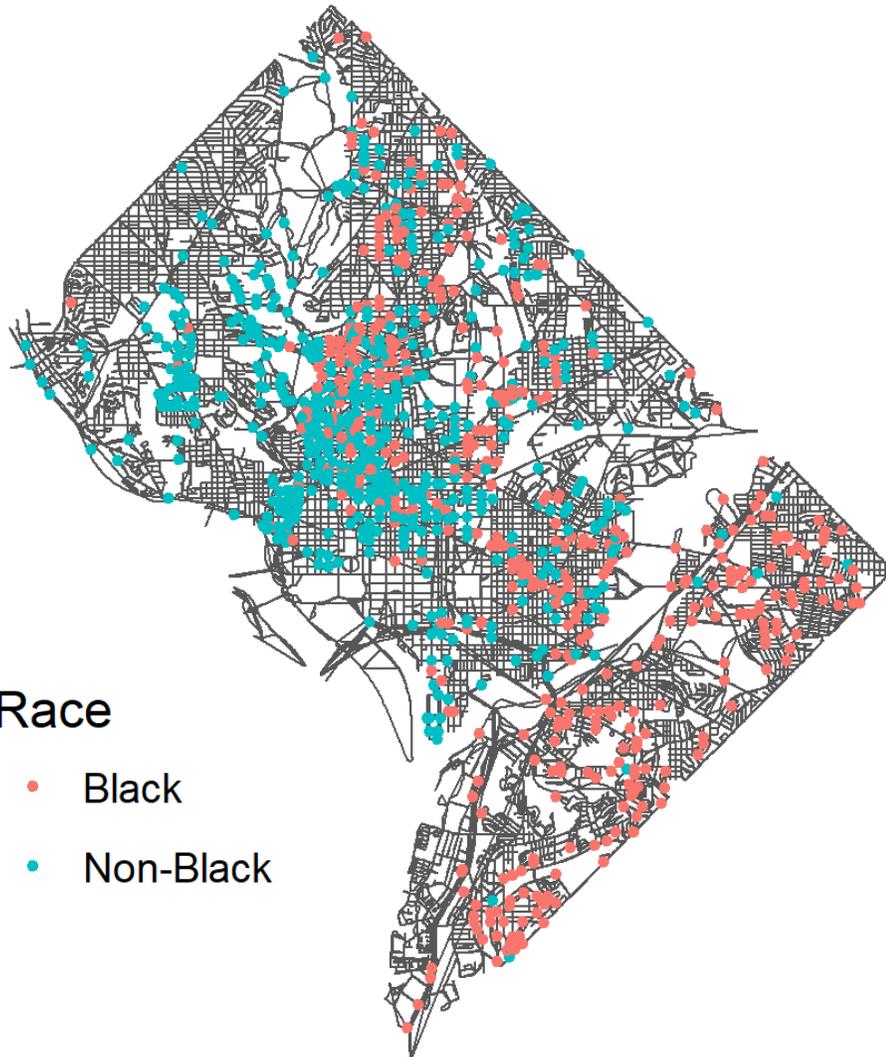


What's new in ASPIRE Tobacco Town

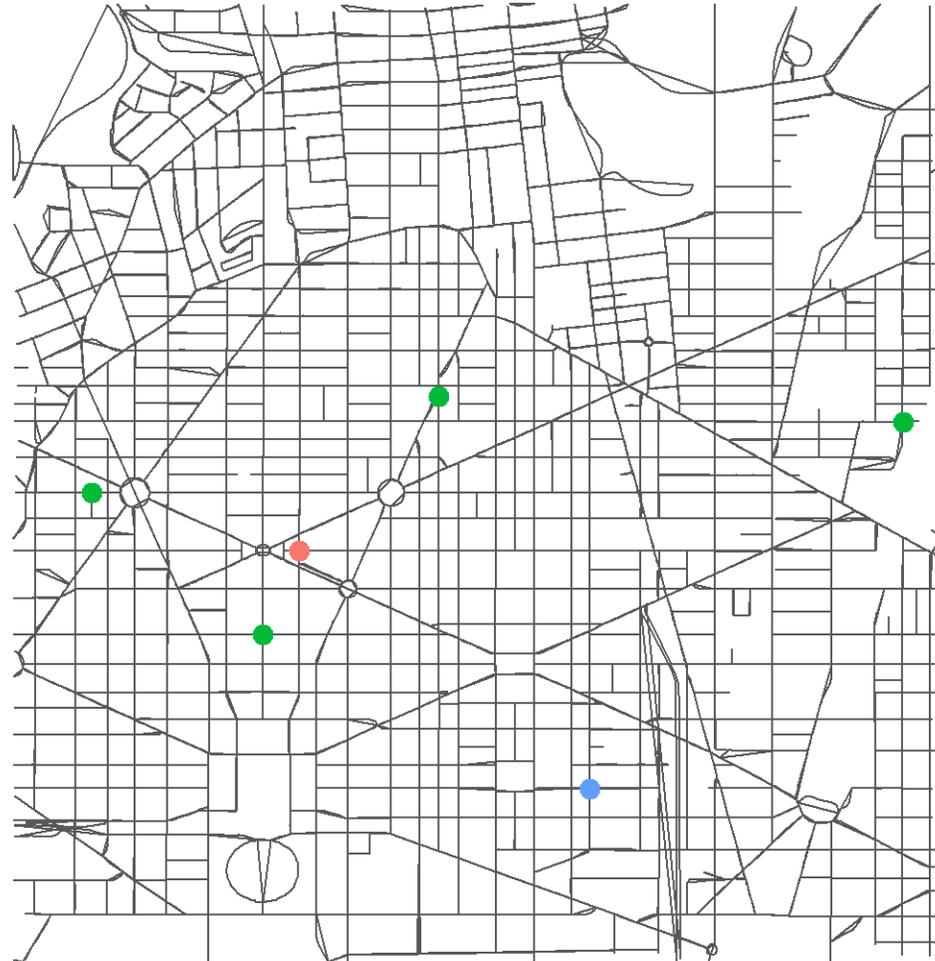
- Adding more policies
 - Pricing
 - Minimum price (price floor)
 - Prohibiting discounts & coupons
 - Finer detail for density reduction policies
 - Cap & winnow number of retailers by neighborhood or ward
- Incorporating real geography
 - Streets, natural boundaries, routes
- Incorporating real sociodemographics
 - Reflecting truer neighborhood characteristics



Using real demographics to build populations



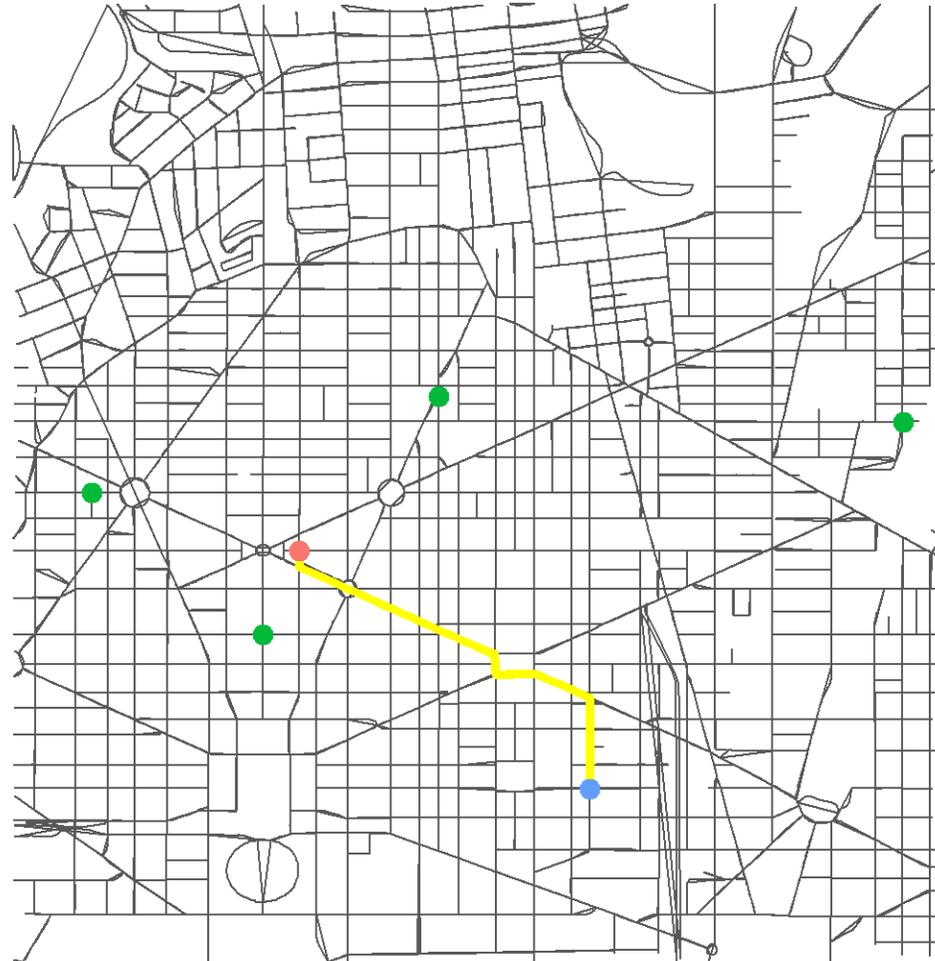
Using real geography to map daily routes



Color

- Home
- Retailer
- Workplace

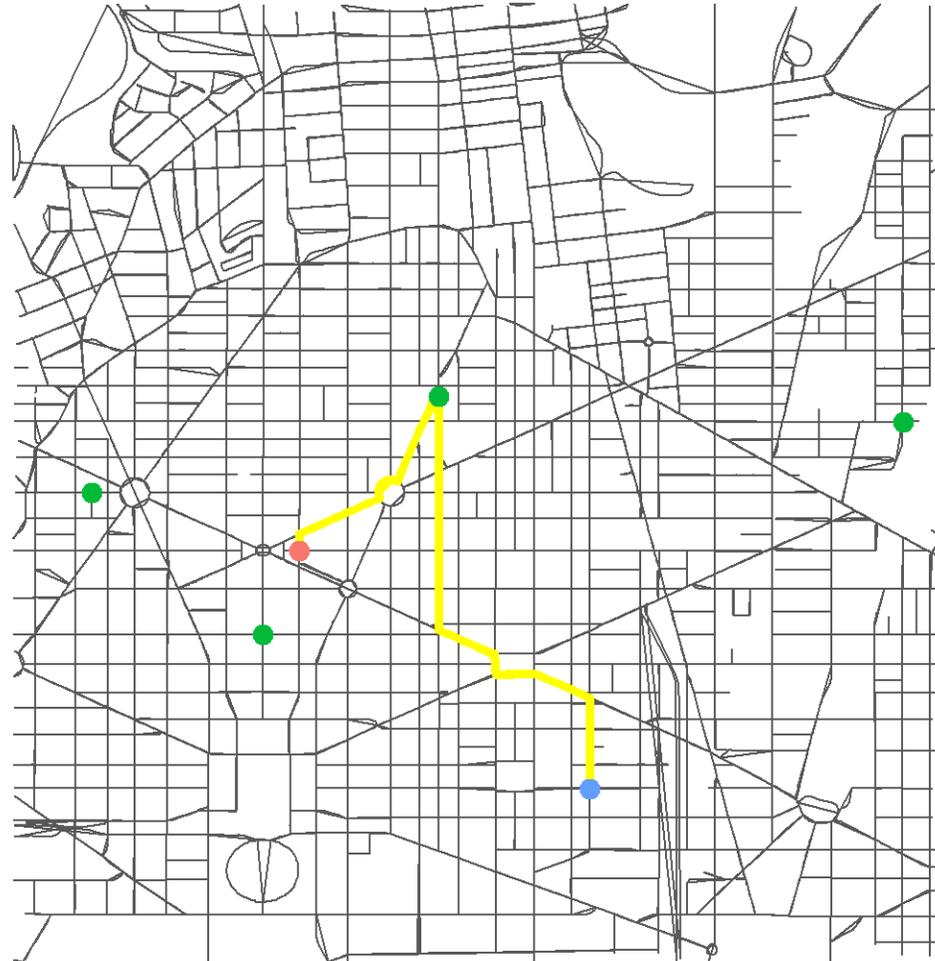
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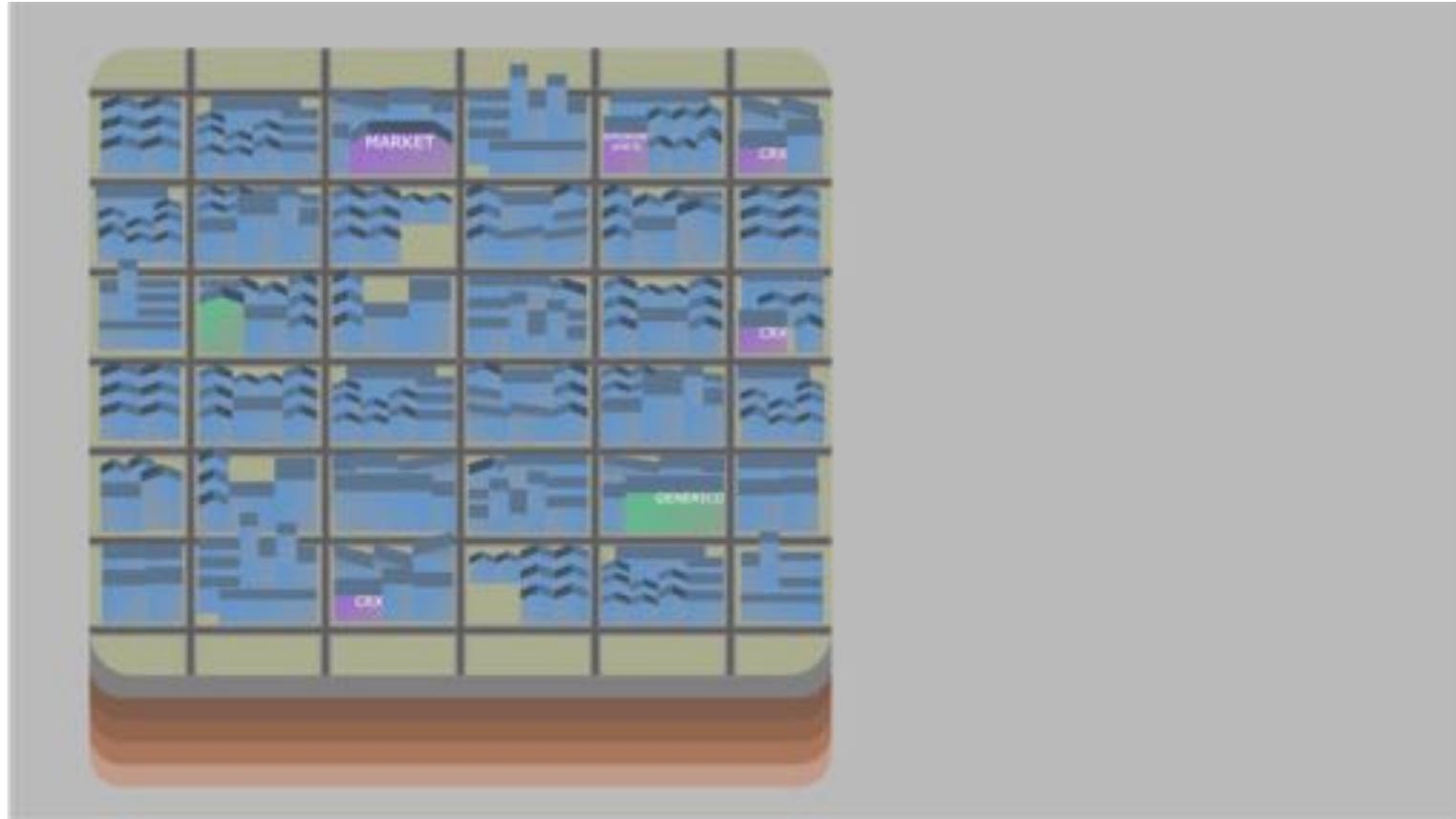
What do we hope to discover?

- Which policies have the *strongest potential effects*?
- Which policies might work best in *specific contexts? Populations?*
- Which policies might address the *most pressing problems in my community?*

<i>Result</i>	Community	Neighborhood	Population	Policy
Potential retailer density reduction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Estimated cost increase	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Likely reduction in use	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Looking ahead to dissemination – Example from Tobacco Town Minnesota



<https://tobaccotown.shinyapps.io/Minnesota/>



How can we maximize impact?

And how can your community benefit from this work?



Maximizing impact & benefits for all

Tobacco Town goal	CAB Benefit	Asks of CAB
Policy impact estimates & comparisons	Help in choosing best for your city & priority populations	Let us know which you're considering
Choice of CAB cities (6-8) to model	Representative cities, neighborhoods, or populations to build evidence base	Work with us & share data
Disseminate & share results	Actionable products tailored & translated for you	Let us know which format & what to emphasize for your community & audience



Maximizing impact & benefits for all

- How can we design the Tobacco Town models so that the results can benefit your community?
- Which types of retail policies (built and consumer) are of most interest to you and your community?
- How can we provide results of Tobacco Town to you in ways that would most inform policy development and implementation?

