

UF Policy Discussion Notes 9/20:

Dr. Elizabeth Baca from the Governor's Office of Planning and Research (OPR) thanked the audience for attending this discussion, and specifically thanked several members from SCAG, SGC, OPR, and Urban Design 4 Health for helping to put this day together. She then asked the members of the audience to introduce themselves:

- Rye Baerg, SCAG
- Randall Winston, SGC
- Nicole Iroz-Elardo, UD4H
- Linda Helland, CDPH-OHE
- Larry Frank, UD4H
- Dan Woo, CDPH
- Meredith Lee, CDPH
- Barbara Weller, ARB
- Annalisa Schilla, ARB
- Jeffery Rosenhall, CDPH
- Jessica Nguyen, Changelab Solutions
- Kate White, CalSTA
- Dov Kadin, SGC
- Solange Gould, CDPH
- Corey Brown, RLF
- Will Barret, ALA
- Jason Vargo, CDPH
- Christine Corrales, SJCOG
- Kim Anderson, SJCOG
- Bill Sadler, Public Health Alliance
- Tracy Delaney, CALTRANS
- Nate Roth, DOC
- Mike McCoy, SGC

Randall Winston then gave the opening address:

- The State is interested in helping the public and officials determine best land use scenarios and outcomes for their communities, which the UF tool can do. Exciting time in CA and in the nation because Governor Brown and OPR Director Ken Alex in NYC just announced new UN partnership for the global action summit in SF in the fall. CA needs to lead the way and it is: we recently extended cap and trade which is a market-based mechanism that puts a price on carbon and helps fund programs to reduce Green House Gas emissions.
- There has been a suite of activities on energy efficiency, and renewable energy. The state is pushing forward on climate adaption and resiliency with huge, ambitious and challenging goals like the one to go into 2030 with 50% renewables powering the grid.

Excited that you are diving in to urban footprint, which is creating consensus locally, visualize land use options and get real time situational awareness on land use resources.

After Randall finished his remarks, Rye Baerg from SCAG provided an overview of what SACG is and the provided the following statement:

- Local communities in our region pushed SCAG to be engaged on health and physical activity and we see Urban Footprint as a way for us to get to that place. We look to UF to provide background to show why health is important and the intersections on health and transportation. We have plans to use UF moving forward, helping to implement our upcoming RTP.

After Rye finished his remarks, Solange Gould from CDPH gave a presentation on the links between the built environment and health:

- Going back to 18th and 19th century, the rise in urbanism caused land use planning to emerge as a way to handle disease outbreaks. The sanitation movement formed the basis for land use planning and public health. This also led to the rise in Germ theory: diseases located in the host and can be spread, which led to public health shift of focus to the individual and behavior. This leads us to the social determinates of health, and things in the built environment that drive and impact our health.
- Work at CDPH's Office of Health Equity:
 - Health equities are differences in health outcomes in groups that are systemic and avoidable like certain diseases and risk behaviors.
 - Anyone providing services to communities knows that it is really hard to tell someone to live healthy when they live in a community without fresh and healthy food, no active transportation methods and no lighting/unsafe conditions
- Living conditions: conditions where we live, work and play created by institutional and social inequities. These are the causes of the causes. We call these the social determinates of health, which are critical to achieving true health equity. I left us off in the 20th century, but the past decade has shown shift of the frame of the work we do. Public Health's attention these days is on on transportation, land use planning, trauma, and inequity.
- The built environment plays a significant role in public health and shapes the social environment. When we say built environment, we think bricks and mortars. But often has a co-creative effect with the social environment.
- Talking today about built environment within a healthy community framework:
 - Healthy community= healthy and affordable housing, green spaces, and other livable conditions.
 - Essentially, it is a society that creates conditions to meet the basic needs of all:
 - Safe, sustainable, accessible and affordable transportation
 - Access to healthy foods
 - Access to high quality schools and access to physical activity

- Complete and livable communities—located next to affordable housing, job centers, and transportation
 - Active transportation that helps meet the state’s climate goals
 - Quality sustainable environment:
 - Clean air, soil and water, free of excessive noises
 - Green and open spaces including ag lands
 - Minimized toxics, greenhouse gas emissions and waste,
 - Affordable and sustainable energy use
 - Adequate levels of social and economic development
 - High quality education
 - Living wage and healthy job opportunities for all and a thriving economy
 - State investments paying greater and greater attention to labor and workforce development including language on state applications to higher harder-to-hire populations. There is much to be done in this area in terms of aligning economic co-benefits.
 - Provides conditions where social relationships that are supportive and respectful can thrive:
 - Robust social and civil engagement
 - Socially cohesive and supportive relationships, families, homes and neighborhoods
 - Safe communities free of crime and violence
 - Housing for all income levels, community voice in shaping their own communities to create social cohesion, not afraid of being displaced
- Supporting the social environment can help the built environment. One example is that when investments in active transportation are diminished because people do not feel safe to utilize them
- Health impacts from major sectors of built environment
 - Transportation:
 - Direct and indirect impacts
 - Face obesity epidemic which is severe among low income and communities of color which can result in billions of dollars of lost productivity
 - Even small improvements in physical activity can result in large improvements in health
 - Motor vehicle collisions are the leading cause of death, which disproportionately impacts communities of color because of lack of infrastructure
 - Community improvement can increase costs in rent and affordability in communities and can lead to displacement. Growing body of research documenting health effects of displacement in the literature
 - land use
 - inextricably linked to transportation
 - urban greening, community gardens, and expanding parks all have health impacts from the built environment

- Climate Resilience
 - CA's climate change approach is incredible because of its focus on urban design and agricultural land conservation which can improve health and equity while fighting against greenhouse gasses.
 - The capacity for resilience in face of climate change is influenced by current health conditions which includes a range of everything covered today
- Health in All Policies:
 - People do not live conditions in a silo-ed way, systems all impact each other. Public health agencies can only do so much.
 - This current age of scenario planning is to understand and plan healthy communities for the future. RTPs forecast for 20 years, but we are making decisions now that will affect CA for the next 100 years.
 - We have learned a lot about working together to holistically improve communities in CA and need to continue coming together to share best practices, align funding, and improve government.

After Solange finished her remarks, Nathaniel Roth from DOC gave a presentation on scenario planning:

- My presentation is on what scenario planning is and why we do it to get a good baseline on why we are doing this work here today. I also want to give UF and other tools that orbit around edge a spotlight.
- Scenario Planning:
 - Couple of key points:
 - First: Your data and variables need to be internally consistent to get a true result. If you want to test, you want to make sure that variables are consistent with rest of land use, and other inputs so that it is not standing out alone
 - Does not need to be a forecast as these scenario planning tools are very useful to project what has been happening in the past into the future based on statistics and data.
 - The point of these models is that we are trying to look at what happens if we change the way that we are doing things in the present.
- Elements of scenario planning
 - What it really comes down to: use of multiple scenarios to compare how suite of options address issues you are interested in. The intention is not to show better scenarios, rather to show what scenario does better in a certain area under a certain set of conditions.
 - There is a large role that scenario planning can play in public and stakeholder engagement. The public is able to come in front of decision makers to give their input using the same data and models that the decision makers are using.
- Why develop scenarios:
 - Let's say we have set of scenarios: have range of possibilities that we expect but want to look outside the box to see what is possible. This way, local decision

makers will be able to chart what investments and course corrections are needed to achieve future goals of the community.

- It also helps compare alternatives and put them into a matrix or graphic to look and see which scenarios are optimal to achieve all of these goals.
- Building consensus and partnerships
 - These tools can be used to help communicate set of options so folks can clearly identify why decision makers are going forward with sets of decisions. This increases transparency, and can serve to reduce arbitrariness.
- What is UF?
 - Scenario planning platform primarily addressing land use and impacts resulting from that use
 - Runs on server, users rarely interact with the underlying technology
 - Users access the tool through web in almost all cases. UF was built using open source tools, and can be built upon.
 - Funded by wide ranging set of mechanisms: State of CA, MPOs, NGOs, and federal and state grants.
 - Map based interface, options of analytic tools that paint land use over old use. There are multiple pieces that the user can take direct control over and highlight vision for the future
- Other applications:
 - Envision tomorrow+
 - Fregonese associates in partnership with the University of Utah
 - Run on desktop as extension of ArcGIS software from ESRI. Uses excel documents brought in with substantial loading as macros to run analytical components
 - While Envision tomorrow has similar capabilities as Urban Footprint, it does not have the level of integration
 - Community Viz
 - Places same environment as envision tomorrow but not quite self-contained scenario creation engine. People pick and choose engines they want to use to get the results that they are looking for.
 - Index, Whatif, iplace are all legacy tools that you might come into contact with

After Nathaniel finished his remarks, Nicole Iroz-Elardo from Urban Design 4 Health gave a presentation on the CPHAM component of UF:

- We want better information for members of the public and decision makers, and health is one of the most impactful policy areas that speaks to people any way that we present it. Mortality and morbidity is an impactful and tangible measurement to people. We need to continue extending scenario planning into the decision-making world and monetize it to lead to better land use decisions.
- The environment and travel systems interact with each other and create land travel activity patters. We chose where to live based on our environment and the local exposures that the built environment creates.

- Biologically we know that energy in and energy out matters, we know that systemic inflammation from pollution matters and that chronic disease can be caused or compounded by the built environment. This provides good storytelling starting point to get to health care and productivity costs where we want to be to get the public and decision makers attention
- Two physical activity models out there
 - Land use regression model: CPHAM, NPHAM.
 - Able to land people with addresses in places where we know land use patterns and characteristics about the built environment to create relationships that we can use to predict what if scenarios
 - Scale of analysis is quite small and info can be aggregated into even smaller areas
 - Need a lot of built environment variables, which is why the CPHAM model suites scenario planning tools like UF
 - CPHAM has intermediate outputs of physical activity, body mass index, and travel models might not have as robust of travel outcomes
 - Report out in morbidity, talking about cases of type II diabetes, hypertension and CVD
 - Relative risk application: single dose response between physical activity and health impacts ITHIM, HEAT
 - Relationships identified by literature review and analysis is generally about taking the average person under those conditions. It is a spatial, providing average responses based on average environment. It does not account for variation in built environment that changes activity patterns
 - The outputs are measured in “disability adjusted life years” which we have found is not persuasive to decision makers that do not have the technical background that epidemiologists have.
 - With this model, you need travel time by mode because you’re just getting physical activity. These inputs can end up being just an assumption, which can impact the replicability and impact of the findings.
- CPHAM is a chained approach with internal regression models
 - You start with the built environment and demographic inputs and predict walking minutes, biking minutes. From that, we calculate minutes of moderate and vigorous activity. From that, we can predict BMI and use BMI and physical activity to predict disease
 - CPHAM study region: 30 counties, 5 CA regions. Wide variation, dense urban to exurban and rural which can apply across the US:
 - SF bay area
 - Sacramento region
 - San Diego
 - San Joaquin
 - Southern California
 - The tool is built off of surveillance data with a large sample size

- CA Household Travel Survey, California Health Interview Survey are all used
 - Cohort specific model development which, as a result, can break the data into age groups, seniors, adults, teens and children, which is unique
- Covariates always included in building are:
 - Age, sex, race, education, adult employment status, home ownership, income, vehicle availability, disability status, presence of children, and household size
 - Model variables in the Built environment: walkability index, residential development, FAR, local street length. We know all of these things about the modeled environments and can predict behaviors and, therefore, health outcomes.
- NPHAM
 - Goal: develop a nationally applicable health impact tool that empowers communities and developers to quantify localized health impacts of alternative land uses and transportation scenarios using replicable data from all over California
 - NPHAM connects with existing tools:
 - Urban footprint, envision tomorrow, community viz

A meeting participant asked: It sounded like CPHAM doesn't measure dementia, depression and cancer. Is that correct?

- Dr. Iroz-Elardo: CPHAM and NPHAM do not, but ITHIM does. This is an area of growth that we are moving towards for our models because it is certainly very important.

Kate White asked: MTC is an obvious missing MPO in the list of users you identified. What do they use?

- Dr. Iroz-Elardo: They are using urban sim, which is a single developer propriety software developed at UC Berkeley. It is a predictive model, but can forecast real estate. microeconomic simulatations.

Will Barret from the American Lung Association asked: Would air quality side of things come along on NPHAM?

- Dr. Iroz-Elardo: That is certainly a next step for us. It has proven rather challenging to get data.

A meeting participant asked: I understand that several groups are using the ITHIM approach, as opposed to the CPHAM/NPHAM models. Are there ongoing discussions on how those interact?

- Those are two different types of models, and I would say that they have different uses. CPHAM is effective because it helps you understand spatial diffusion of disease, which is becoming increasingly more important.
- Dr. Frank: If you want to predict physical activity, you need to see the built environment and how that impacts it. ITHIM misses that relationship and CPHAM does not.

Break

After the break, Rye Baerg from SCAG gave a presentation on SCAG's use of CPHAM during their upcoming RTP/SCS process:

- SCAG has been through two rounds of this process, in 2012 and 2016. During 2012, there was a lot of input from stakeholders to do more predictive modeling around active transportation to make a case for more funding, which is where UF and the nested CPHAM comes in.
- Use CPHAM for a number of things which is customized for our region:
 - Manage data, reach out to all 191 cities in our region and ask them to validate parcel level data in their jurisdiction
 - Currently in process of two initiatives
 - Devolving Data management which will allow jurisdictions to update parcels internally into the system to maintain up-to-date data
 - Localizing the system so that locals can use the data for their own planning needs
- UF characterizes built environment and CPHAM models physical activity and public health. SCAG hopes to monetize health care costs to lead to healthier planning and infrastructure funding
 - We took a scenario trend with expectations for development to occur over the next few years in certain areas in our region and then created four scenarios based on policy goals of the region. Policy A called for concentrating development in high quality transportation areas.
 - Current trends in our region point to the trend that 86% growth will be standard, auto-oriented development. We developed policy A for the 2016 RTP where growth is mixed.
 - Glendale case study: use high quality routes, transit areas, and land use to show increased quality of all transportation infrastructure and types of development.
 - Positive shift in walking and biking resulted in moderate reductions in diseases. This is a demonstration of the changes in the built environment that have positively impacted health outcomes. This leads to healthcare savings and to more productivity in the region.
 - After the 2016 RTP, we took health outcomes and monetized the reduction in healthcare spending in the region. We found reduced healthcare costs in the region by \$373 million annually. We then took those health outcomes, and created a spending plan for active transportation and ran those numbers through REMI. We found \$113 billion dollars in economic activity in our region because of these changes in health outcomes. Health benefits lead to increased productivity and can create more output. We see that benefits compound and grow over time.

- Easy to show these results to our elected officials who can tangibly understand what we can do with our investment and what growing that investment would do. We see opportunities as using CPHAM as a part of UF for a number of outcomes. Want to integrate this kind of cost benefit modeling into our analysis for the 2020 RTP to make case to elected officials
- Have used this base data in our active transportation planning which is benefited by this block by block data offered by this tool

After Rye finished his remarks, Larry Frank from Urban Design 4 Health gave a presentation on the NPHAM tool:

- NPHAM is built off of the same architecture as CPHAM, and is using census block group data in CA to roll out the same model. CPHAM's data is transferable because California has the best surveillance data in the country
- Making the case:
 - CA is really up to speed on scenario planning as a use for better decision making. There is a strong rationale to continue this, and I predict that this is only going to grow as a science. Our focus now is to build the cost-based rationale into the model to help monetize the data output for the decision makers. We are doing a better job at getting at active transportation monetization, but we are coming a long way on the transit monetization to show how important it is as an investment.
- Expanding the user base:
 - Some of the things we see as ways to improve the model
 - We are fortunate to have adopters like SCAG and SJCOG
 - State of CA now has two tools, CPHAM for the urban areas and NPHAM for the rural areas.
 - Need to develop training materials that are easy to understand to expand user base and show when to use different tools and how they can be used together and work interactively. We want both the illustrative and the technical details with use cases packed for consumption by potential user groups.
- Future considerations for the model:
 - Bringing pedestrian environment features with seating, lighting, surveillance, sidewalk characteristics, vegetation and crossing characteristics to better show where gaps are in active transportation to drive investment. Can frame in a context of complete streets to decision makers
 - Capturing synergistic relationship between walkability and pedestrian environment and show a cost benefit of complete street improvement to allow decision makers to prioritize where to make complete street investments, which could enhance environmental justice by focusing on areas of low income or underinvested area.
 - Natural environment
 - There are park access measures in CPHAM but we can bring in green infrastructure multi-spectral LIDAR data. We have Sacramento as a case

study, where the local tree canopy is leading to better community health. Can also model linkages with social capital and sense of community

- People that live in places with green infrastructure have better capital, which is very politically sell-able
- Also need to better link income with wealth to attribute differences in seniors versus the other age groups
- Air pollution exposure and generation not currently included in the model
 - Small area particulates and large area ozone with the combined effect of behavior and exposure as it relates to cardiovascular, respiratory and obesity outcomes.
 - We can also focus on generation side, where we can predict air pollution generation to avoid investing in transportation infrastructure that leads to increased pollution
- We also want to track policy compliance:
 - Tracking local performance over time to document the proportion of the local population that is located within healthy environments. Provides bases to pursue performance-based funding.
- Expand health and transportation data collection with objective physical activity data collection.
- Integrate bike and pedestrian network into model

After Dr. Frank finished his remarks, the session entered its round table phase. Sitting on the roundtable were Mike McCoy, SGC; Rye Baerg, SCAG; Larry Frank, UD4H and Nicole Iroz-Elardo, UD4H. Dr. Elizabeth Baca facilitated the panel.

- Elizabeth: Can you talk about injuries and mortality from collisions and how that is treated in the model right now:
 - Rye: We have currently compiled collision data from the region, but need a lot of pretty specific information such as type of infrastructure and collision impacts of the infrastructure in order for the model to be useful. We do not currently have specific data on number of collisions and are investing in a lot of data collection to try to build that up
- Elizabeth: Does CPHAM address that lack of information?
 - Larry: No, but it does have some of the key indicators of that.
- Elizabeth: Have any local governments helped you to enhance the model?
 - Mike: The City of Elk Grove is a standout example here. In their most recent General Plan update, they used this data to help them create effective land use planning decisions.
 - Rye: Starting next year, SCAG will be training local governments to use scenario analysis pieces of UF for themselves to be better informed locally.

- Nicole: That is a great way to support local governments to engage in this work. As you all know, there is more to regional governance than just an RTP, and these tools can be used in those cases as well.
- Elizabeth: We have seen a disconnect between policy leaders and the public that these tools can help bridge. Inequities tend to play out at the regional level with housing affordability, and jobs, and yet carrots and sticks for addressing them are very few, often because of strong local control. For SCAG, your cities have strong authority over RTPs. Can you see this tool as a way to much better nuance the equity conversation and pressure locals to handle this through the picture that modeling paints?
 - Rye: Theoretically, one of the issues is related to demographics. Income has a stronger impact on health than the built environment. When we placed the new population in UF, we had to create a synthetic population to measure built environment impact. If you wanted to take high quality transit areas and assume they would gentrify, you could see the outcomes of that ripple through UF and the health impacts of that funding. But that would take a lot of political will.
 - Mike: This is a difficult problem, as we often see that even progressives are against low income and dense housing. What you described is a process of coalition building. The economic impacts of the built form mediated through health are things that attract the businesses community and the Chamber of Commerce that can really impact those discussions
 - Nicole: CALTRANS is finishing up conversations on how to think through ways to have consistent measures and analysis to have performance measures attached to a housing transportation affordability index to learn what really works and what doesn't in this space. It is so hard to predict where the next displacement/gentrification will happen. We know what causes pressures, but what areas truly flip is hard to predict 5 years out must less 20. This makes for a big challenge because we have fine scale data but are temporally constrained because of those factors.
- Elizabeth: I know that you are trying to build conservation model to tie into UF or use UF's own conservation model. I am wondering what capabilities exist to integrate factors in the non-built environment and how that impacts public health?
 - Nicole: There is a correlation in land use patterns that we see. If you constrain the urban edge and place growth in the center then you will get at that conservation challenge and that is what the model would indicate. This has many implications for public health.
 - Mike: I've used UF and other tools as overlays to conservation data pretty regularly and found that in quantifying impacts to conservation values you can quantify losses by habitat type. The state is currently working to integrate wildlife efforts into a single identification of priority conservation areas which would run compatible with urban models so that choices can be made between development and conservation. This feature should be released soon.

- Elizabeth: I know that we are getting to a point where we can monetize the cost to the natural environment through building decisions, but can you link the conservation and public health outcomes for us?
 - Mike: Sonoma County has commissioned a study to incorporate carbon sequestration from agriculture lands into urban footprint as a monetization tool. We have good examples of the impacts on the rural economy between built and natural environments.

- *Will Barret from the American Lung Association asked:* We are involved right now because getting to results is important from an advocacy perspective. Have you found a different reaction about policy decisions coming from this modeling as opposed to other ways of making decisions?
 - Rye: SCAG got involved in this because stakeholders asked us to create this kind of data-based decision tool. If you go back 5-7 years ago, there was a big shift among our elected officials of a combination of showing this data and some of the work of our other campaigns. We did receive questions about our monetization of the health impacts of the built environment, but put those to rest by showing that it was the same standard of measurement as our other studies
 - Nicole: SCAG was the first MPO in country to do this type of side by side analysis and that should be celebrated. When I was working in Oregon, we were tasked with putting dollar and health benefits on local climate action plans. Decision makers like it, as long as technical people can make it work effectively and efficiently.
 - SCAG: I also think it is important to note that this tool can't stand on its own without advocacy backing it up.

- *Dan Woo from CDPH asked:* What are the next steps for the CPHAM build out?
 - SCAG: That is to be decided. We have a few technical issues that we need to tackle before the next RTP and then determine the nice-to-haves versus the basic modeling upgrades we need to do at SCAG. We should have a better idea in the next 6-12 months.
 - Nicole: CPHAM is dependent on SCAG's direction for this RTP. NPHAM still coming and will be rolling out over the next few years. Mental health is in NPAM right now, and can be used to measure that if that is your data goal.

- *Dan Woo from CDPH then asked:* How much cost has been devoted to running these models?
 - Rye: We can run model in-house and have modeler that can run all of these systems confidently. The cost is relatively low after the initial investment.
 - Mike: We tried to estimate on a city basis how much staff time it would take to run these models but it is difficult because it is really a team of staff that all work together to integrate into. There is a chronic problem of front-end back-end

loading and our answer is for the state to fill gaps before institutions can find the staff to take over.

- Larry: We are always getting asked by locals more and more to use the tool, and it is somewhere around \$100,000 to start using. CPHAM is not that expensive if data already exists and we can even go under that 100 figure.
- Nicole: Pricing challenges arise when who is doing scenario planning work: whether it is done by in-house staff or other consultants. Hard to make the case to run this model if not dedicated staffer champion in public health and transportation.
- *Dan then asked:* I'm curious as to the scale that CPHAM can apply. Not necessarily a project-based level that can prioritize for grant funding correct?
 - Larry: Actually, it is totally scalable. That is what its strength is. CPHAM is perfect for transit oriented development, stationary tool that can be scaled to any need.
 - Nicole: It would need to be a big enough project to make a difference on that block grant level in order to show up in CHPAM.
 - Rye: You also will want to ask what your project is: specific plans would work perfectly.
- *A meeting member asked:* Is access to healthy food or food insecurity factored into this model?
 - Rye: Part of our environmental justice analysis focused on access to healthy food but this model doesn't specifically address that.
 - Nicole: But you can add consistent way to measure access to different sources, an food sources are one of them. We should consider adding that in the next update to the tool.
 - Larry: Always options on the research side, but the data side varies. We do have parcel data and can add food environment. There is dietary data in CHIS, but we have run into a lack of correlation in the past.
 - Nicole: Distance to nearest restaurant is currently in the model, but it is certainly not a quality measurement.

End