Populating and Facilitating Urban Sustainability Transition Arenas

by

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ABSTRACT

Urban areas face a host of sustainability problems ranging from air and water quality, to housing affordability, and sprawl reducing returns on infrastructure investments, among many others. To address such challenges, cities have begun to envision generational sustainability transitions, and coalesce transition arenas in context to manage those transitions. Transition arenas coordinate the efforts of diverse stakeholders in a setting conducive to making evidence-based decisions that guide a transition forward. Though espoused and studied in the literature, transition arenas still require further research on the specifics of agent selection, arena setting, and decision-making facilitation. This dissertation has three related contributions related to transition arenas. First, it describes a process that took place within Phoenix that focused on identifying, recruiting, and building the capacity of potential transition agents for a transition arena. As part of this, a first draft suggestion of plausible steps to take for identifying, recruiting, and building a team of transition agents is proposed followed by a brief discussion on how this step-by-step process could be evaluated in subsequent work. Second, building on such engagement, this dissertation then offers criteria for transition agent selection based on a review of the literature that includes the setting in which a transition arena occurs, and strategies to support successful facilitation of decision-making in that setting. Third, those criteria are operationalized to evaluate the facilitation of a specific decision (draft of a new transportation plan) in a specific transition arena: the Citizens Committee for the future of Phoenix Transportation. The goal of this dissertation is to articulate a first-draft framework for guiding the development and scientific evaluation of transition

arenas. Future work is required to empirically validate the framework in other real-world transition arenas. A feasible research agenda is provides to support this work.

DEDICATION

This work is dedicated to my wife, Rosalind, and to my daughter, Hazel.

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Chapter 1

Introduction

American urban development faces many sustainability challenges. Existing land use has negative impacts on public health (Frank et al., 2006) and environmental sustainability (Ewing & Cervero, 2010). Automobile infrastructure has been prioritized (Newman & Kenworthy, 1999) above alternatives that improve health (Pucher & Dijkstra, 2003) and reduce emissions (Lindsay et al., 2011), such as walking, biking, and transit development. Developers (i.e. members of the economic elite) have more influence over policy, and thereby development often prioritizes developer over other citizens (Gilens & Page, 2014). Such private development interests have trumped investments in public space, resulting in circumstances such that:

> public spaces are no longer, if they ever were, democratic places where a diversity of peoples and activities are embraced and tolerated. Instead, they have become centers of commerce and consumption, as well as places of political surveillance. (Low & Smith, 2013, p. vii)

Further, preoccupation with economic development has marginalized concerns about social justice and/or social services (Fainstein, 2001). Finally, urban environmental sustainability challenges manifest in many systems, such as stormwater (Barbosa et al., 2012), urban forestry (Conway et al., 2011), and air quality (Elsom, 2014), among others.

Given the sustainability challenges of the present, substantial changes in urban systems are required to achieve more sustainable futures. This dissertation addresses such changes using the concept of a "transition," relying on Rotmans et al.'s (2000) definition: "a gradual process of societal change in which society or an important subsystem of society structurally changes" (p. 19). Transitions are

complex, multi-scale processes on a generational timeline, and require effective management to achieve their goals. The literature describes transition management as:

> a deliberate attempt to bring about structural change in a stepwise manner. It does not attempt to achieve a particular transition goal at all cost but tries to utilise existing dynamics and orient these dynamics to transition goals that are chosen by society" (Rotmans & Kemp, 2003, p.15)

Transition management will often be seated in a "transition arena": "the actual initial incubators of change… crewed by local frontrunners that are considered as engaged visionary people with diverse backgrounds" (Nevens et al., 2013, p. 111). The transition arena concept, as discussed in this dissertation, arose around a national sustainability energy transition in the Netherlands (Kemp & Loorbach, 2003), but will be applied herein at the urban scale (Nevens & Roorda, 2014). In cities, transition management might take place in "Urban Transition Labs" (UTLs) (Nevens et al, 2013), which host a transition team that feeds information to a city's various transition arenas for different places, issues, and scales. However, many cities lack a centralized and defined UTL, leaving the "Involved Actors" specified by Nevens et al. (2013) to collaborate in emergent transition arenas, rather than their defined hierarchy of UTL, transition team, and subsidiary transition arenas. Thus, this dissertation compresses the hierarchical taxonomy of UTLs back into the simpler conceptual structure of "transition arenas," in order to match the context of most American cities.

Urban transitions will often have smaller transitions nested within larger efforts (Nevens et al., 2013), driving transition arenas to coalesce in context, as needed, with potential overlaps, or simultaneous contributions to multiple

transitions. This complexity contributes to what Nevens et al. (2013) describe as the multi-scale conceptual challenge:

> Politics and governance dynamics are complex and transcend system (or sectoral) boundaries. Accordingly, dynamics of urban sustainability transitions need to be investigated in multiple scales in order to understand the embeddedness of transformation processes in space (p 113).

To address the multi-scale conceptual challenge, this dissertation operates at a specific scale: discrete decisions within a transition, made within a transition arena. Presently, "analytical rather than an action focus dominates the urban transition scholarship" (Nevens et al., 2013, p. 113), and transitions aspire to take place at the scale of "long term vision guided sustainability trajectories" (Vandevyvere & Nevens, 2015, p. 2418). Unfortunately, however, these generational scale concepts do not necessarily support effective, iterative development and validation of the components of an intervention (Rotmans & Loorbach, 2009). Based on this, more immediate proximal metrics of success for each individual transition arena, and in particular, each decision that might progress a transition, are largely lacking from the current literature.

Urban transformation can sometimes hinge on a single decision, and evaluative criteria can both assess past decision environments and be applied to design future decision environments. This work borrows several concepts from the health behavioral science field, particularly on the study of what is being labeled, "Just in Time Adaptive Interventions" (Nahum-Shani et al., 2014; Nahum-Shani et al., 2015). Just in time adaptive interventions (JITAIs) are targeted interventions that support an individual engaging in more positive behavioral patterns (e.g., living a healthier lifestyle via increased physical activity or reduced alcohol consumption). Pertinent to transition interventions at a societal scale, the purpose of a JITAI is to

1) identify the moments (in the JITAI literature, these are labeled "decision points") when a more favorable behavioral option is possible; 2) intervene at that decision point; and 3) provide the most appropriate intervention in context. Proximal JITAI outcomes (e.g. a discrete decision within a transition made by a transition arena) are short-term and, ideally rapidly measured outcomes that ultimately contribute to the emergence of a distal outcome. Distal outcomes are the final desired outcome of a process (e.g. the overall goals of a transition).

To address the multi-scale conceptual challenge, this dissertation assumes that transitions of complex urban systems ultimately include a wide range of smaller, nested "decision points." It also assumes that these decision points occur both from an active deliberative process (e.g. the organization of a UTL) and from happenstance (e.g. an emergent development decision falling to specific developers based on the status quo). A central goal of this dissertation is to better identify "just in time" decision points within a transition, and to articulate a draft set of evaluative criteria for the "proximal outcomes" of decisions made by transition arenas. These draft criteria are only a logical first draft that future research should iterate upon, but are hoped to be of use in designing transition decision points within transition points in the present.

To inform the proposed criteria, this dissertation describes initial engagement with potential transition agents to articulate a plausible strategy on how to start to identify transition agents for transition arenas (Chapter 2). The purpose of this process is to establish a plausible step-by-step process based on this real-world experience, as opposed to purely analytical experience, which has dominated the sustainability transitions literature (Nevens et al., 2013). Selecting

those agents is a key success factor for the transition at large. Of particular interest is the *initial, early* stage of stakeholder engagement. First impressions can make or break a process (Shelley, 2011) by generating support or opposition. In the next chapter, plausible criteria for evaluating a transition arena are described based on a review of the literature (Chapters 3). This is then followed by a preliminary evaluation of a specific "decision point" within a specific transition arena, namely the determination of a comprehensive transit plan for the city of Phoenix that was created by the Citizens' Committee for the Future of Phoenix Transit.

Chapter 2 explores how initial engagement is critical because it can either reinforce power asymmetries, or begin to smooth them. Early stages of participatory processes are opportunities to build new trust and raise stakeholder expectations for the process and its outcomes. Initial stakeholder engagement can reset relationships that have soured, and involve new stakeholders to increase representativeness. Overall, the initial stage of stakeholder engagement is the first step in developing a first-pass guess or "sketch" of a conceptual framework for understanding a particular transition arena, particularly the transition agents who will populate the transition arena(s) that make decisions about an urban sustainability transition.

Transition arenas are often described as just networks of actors (Van de Kerkhof & Wieczorek, 2005; Loorbach, 2007). However, they are more accurately conceived as those actors, the institutional settings that facilitate their collaboration, and the tools used for that facilitation. Chapter 3 therefore collects criteria for transition agent selection, transition arena settings, and transition arena decision-making facilitation tools, which can be applied to both evaluate specific

decisions within transitions, and design decision environments. The research questions of Chapter 3 are:

1. What are appropriate domains to focus on for measuring and defining the success of specific decisions (i.e., the proximal outcomes) within urban sustainability transitions based on the previous literature?
2. What is a logical structure to support the design of effective urban sustainability transition arena decision-making environments?

Chapter 3 codifies, based on the literature, how early stakeholder engagement can reveal key tensions in urban development processes, offering criteria for transition agent selection that include representativeness (i.e. how well relevant constituencies and interests are represented) as well as collaborative capacity (i.e. how open transition agents are to the ideas of others). Of course, key tensions remain in transition agent interactions. Existing power asymmetries in urban systems can reduce the representativeness of a transition arena, but those same asymmetries can be the driving force behind the influence necessary to achieve a transition's goals. Similarly, representativeness in a transition arena will include a diversity of perspectives, but nearly always means opposing ideas will be articulated. Some of that opposition will stem from the standard quid pro quo interactions of democratic processes that trade off between individual visions rather than building a collective vision. A core hypothesis of this work is that transition arenas will be more successful if they can move a debate from quid pro quo style interactions to those that foster a collective vision. The criteria described are meant to articulate how best to set the stage of a transition arena to cultivate the creation of collective visions.

Chapter 4 is an empirical study using Chapter 3's criteria to evaluate a specific decision– a new transportation plan– in an urban sustainability transition arena– the Citizens Committee on the Future of Phoenix Transportation (CCFPT)– in Phoenix, AZ. This study examines this specific decision, with a focus on documenting the background that set the stage for this decision point, the human-centered design strategies used to advance to the decision point agenda, and a largely descriptive qualitative and quantitative evaluation based on Chapter 3's criteria. As part of this, a central goal of this final work was to enable the creation of collective vision via a specific decision point, namely a workshop that was used to define the first draft Phoenix transit plan generated by the CCFPT. In our discussion, we will specifically articulate and attempt to provide some preliminary insights on how well our decision support tool and this workshop supported the generation of a collective vision.

Chapter 4's evaluation reveals that quid pro quo interactions might possibly be replaced by "absorptive" interactions between transition agents. This conclusion is the result of evaluating (using Chapter 3's criteria) the proximal outcome of a single decision point (transportation plan), made by a transition arena (CCFPT) in the context of a generational urban sustainability transition (transportation in the City of Phoenix). The contribution of this work is an evaluative platform from which to iterate measurable criteria correlated with improved transition outcomes that is not based solely on an analytical perspective but also takes advantage of pragmatic and real-world lessons from an actual transition arena. Future work will be required to validate the preliminary suggestions made in this work.

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Chapter 2

Initial Stakeholder Engagement for Urban Sustainability Transitions

Key challenges for effective initial stakeholder engagement to support urban sustainability transitions include: power asymmetry, distrust, low expectations, underrepresentation, and low participation among relevant stakeholder groups. Research on stakeholder mapping and analysis in other domains has some transferability. However, the complexity of mapping urban stakeholders' interwoven positions across sustainability topics is overwhelming. Thus, this chapter offers a step-by-step process for initial stakeholder engagement to produce a *time-efficient* and *user-friendly* sketch of stakeholders and their interests. This study uses Reinvent Phoenix as a case to illustrate the proposed steps, and concludes that stakeholder sketching may be more appropriate to urban sustainability transitions than stakeholder analysis and mapping.

Urban sustainability transition efforts are "transformation processes in which existing structures, institutions, culture, and practices are broken down and new ones are established" (Loorbach, 2007, p. 17) in pursuit of sustainability goals. Over their course, such transitions will require transition arenas to manage aspects (or the entirety) of the transition. The arenas will be made up of transition agents, and selecting those agents is a key success factor for the transition at large. The initial stage of stakeholder engagement is the first step in developing the potential transition agents who will populate the transition arena(s) that manage an urban sustainability transition. Therefore, urban sustainability transition efforts benefit from a strong transition agent network that:

1. understands and addresses power asymmetries, so that all voices are heard (Baur et al., 2010)
2. trusts each other and the process, which is necessary for collaboration (Ostrom, 1990)
3. has clear process and outcome expectations (Arnstein, 1969)
4. equally represents affected, responsible, and supporting stakeholders, which generates credibility (Cash et al., 2003)
5. and, most importantly, participates in the process (Clary & Snyder, 2002)

That said, key challenges of stakeholder engagement for urban sustainability transition efforts include: (1) power asymmetries among stakeholders; (2) distrust among stakeholders; (3) low stakeholder expectations; (4) underrepresentation of stakeholders; and (5) low stakeholder participation. Power asymmetries lead to some stakeholders having more process influence than others, for purely political reasons. Stakeholder distrust makes for partisan environments with interest groups "fighting their corner," rather than working together. Low stakeholder expectations for transition projects reduce motivation to participate. Underrepresentation of stakeholders ignores the interests of relevant groups. Finally, inadequate participation renders moot the goals of a stakeholder engagement process. Together, power asymmetry, distrust, low expectations, underrepresentation, and low participation among stakeholders inhibits the ability of sustainability transitions to take off, accelerate, and continue.

Of particular interest is the *initial, early* stage of stakeholder engagement. First impressions can make or break a process (Shelley, 2011) by generating support or opposition. Initial engagement is critical because it can either reinforce power

asymmetries, or begin to smooth them. Early stages of participatory processes are opportunities to build new trust and raise stakeholder expectations for the process and its outcomes. Initial stakeholder engagement can reset relationships that have soured, and involve new stakeholders to increase representativeness. Overall, early stakeholder engagement sets the tone for the participatory process, and can create the momentum necessary to support a sustainability transition.

Over the past 40 years, research has developed evidence-supported guidelines for mitigating initial stakeholder engagement challenges, with numerous insights relevant for the pursuit of sustainability transitions (Mathur et al., 2008, Wiek et al., 2014b). Decades ago, Arnstein's ladder quantified the deficit between perceived and desired public engagement, for both the public and engagement initiators (1969). Krütli et al. (2010) refined that ladder into four discrete levels, and Lawrence (2002) listed enabling conditions for successful engagement. Webb et al. (2009) described how "action-conversations" can help reach underrepresented communities and Stauffacher et al. (2008) advocated an analytic and dynamic style that allows the formality of engagement methods to fluidly change in tandem with the process. Wiek et al. (2014b) concluded their engagement event guide focused on the success factors of preparation, engagement team strength, connectivity between decision-makers and engagement staff, and authentic citizen input beyond "box checking."

Several procedures have been developed to successfully initialize the building of a strong stakeholder network, including stakeholder analysis (Mitchell et al., 1997; Prell et al., 2006; Reed et al., 2008), which spans multiple fields. In the business management domain, Mitchell et al. (1997) built on Freeman (1994; 2010) to define three stakeholder classes and eight types, based on power, legitimacy, and

urgency. For the management of socio-ecological systems, Prell et al. (2006) offered an approach to stakeholder selection based on representativeness, likelihood of constructive participation, and ability to spread ideas widely in social networks. Reed et al. (2008) proposed methods for identifying, differentiating, categorizing, and investigating the relationships of stakeholders for natural resource management.

Stakeholder mapping (Sauer, 2008; Timur & Getz, 2008; Walker et al., 2008; Petruney et al., 2010) is also prominent, drawing on stakeholder analysis to represent stakeholder positions. Sauer's (2008) conflict pattern analysis mapped the conflicting beliefs and interests of stakeholders. Timur and Getz (2008) used network analysis to map the interconnectedness (links) of stakeholders (nodes) in the sustainable urban tourism networks of Calgary, Victoria, and San Francisco. Walker et al. (2008) visualized stakeholder relationships with two tools, first their own "Stakeholder Circle" (2008) that mapped stakeholder distance from the project, scale and scope of influence, and degree of impact; and second, Shelley's (2006) "Organizational Zoo" that illustrated stakeholder relationships with animal metaphors, e.g. "Lions are aggressive and powerful leaders" (p. 13). Petruney et al. (2010) used stratified purposive sampling to map the influence of potential stakeholder interviewees from a broader sample gleaned through Internet research.

However, according to Yang (2014), the accuracy of stakeholder analysis is inversely related to the complexity of the project at hand, and production of a stakeholder map "is quite time consuming" (p. 841). Given the project-based time constraints of many urban sustainability transition efforts (e.g. planning processes, funding cycles, political opportunities, etc.), and the complexity of mapping the

diversity of urban sustainability topics, this chapter proposes that the product of *initial* stakeholder engagement should be a quick and timely *sketch* (Buxton, 2007) that shows the key players, issues, and geographies of the sustainability transition. The chapter asks the following research question: What is a sound process for initial stakeholder engagement? The chapter focuses on this question and does not engage questions of stakeholder engagement during the main phases of urban sustainability transition processes, or the maintenance and management of such networks (Cohen et al., 2015).

The research question is addressed through two complementary lenses. First, a brief review of academic and professional literature articulates common challenges for initial stakeholder engagement. Second, experiences under "Reinvent Phoenix" (Wiek et al., in prep) illustrate a step-by-step process for initial stakeholder engagement that mitigates those common challenges. The remainder of the chapter begins with that short summary of common obstacles, then proposes the step-by-step process, and finally, illustrates that process with a case study of Reinvent Phoenix to discuss achievements and shortcomings.

Methods

The participants in this research were City of Phoenix staff in the Planning and Development, Parks, and Neighborhood Services Departments, Arizona State University faculty and students, and Phoenix citizens. The research was designed with a human-centered design approach (Maguire, 2001). As articulated by Maguire, human-centered design involves a suite of both qualitative and quantitative methods for designing tools and resources for a particular artifact (often software but it can be used for a wide range of domains outside of software such as the

facilitation tools for Reinvent Phoenix). Human-centered design often includes the following general principles: 1) active involvement of those individuals (in this case city staff, students, and citizens), that will ultimately use the final tools to be developed; 2) a careful allocation of function that balances the tasks driven by the individuals/transition agents compared to those driven by the tool itself (e.g., in this case, balancing knowledge of individuals with an appropriate design to enable effective emotional understanding of the decisions that will need to be made to empower transition agents in the early stages of a transition); and 3) the use of an iterative design process, with prototypes generated to help better articulate and define solutions; and a multidisciplinary design team.

Utilizing these principles, there are a wide range of design methods and strategies that can be used (e.g. brainstorming, parallel design, paper prototyping). Within this study, primarily these methods were used: (a) personal interviews with Phoenix citizens; (b) surveys of Phoenix citizens about their visions for Phoenix; (c) sketching/paper prototyping of tools to support interactions with Phoenix citizens; and (d) physical prototyping and iteratively improving forum, workshop, and satellite event tools for stakeholder engagement events. ASU faculty (co-authors) and graduate students in the classes interacted closely with members of the aforementioned City of Phoenix departments during all of these methods and processes. The following methods description is adapted from Wiek et al. (2012a).

The Reinvent Phoenix research team initially decided to focus the project's visioning survey and the visioning workshops on key tensions and to organize an expert panel to help anticipate tensions before initiating community engagement. The experts were asked to: (i) to provide basic values for each of the six planning

elements (economic development, green infrastructure, health, housing, land-use, and mobility) based on ideas of community sustainability and livability; and (ii) to provide contested issues and specific tensions (tradeoffs) related to these values (based on their knowledge about community perspectives). The elicited information was reviewed, synthesized, and revised, yielding more than 20 value tensions or trade-off constellations that informed the subsequent construction of a visioning survey and the design of the visioning forums. In parallel, a series of informal interviews with various stakeholders gauged their interest in Reinvent Phoenix.

The initial visioning survey (Appendix A) was constructed using a "vignette" approach similar to the "scenario approach" in psychometric research or dilemma stories in preference studies (Menzel & Wiek, 2009). The full survey construction and distribution comprised more than 10 steps, including: various rounds of drafting and review (research team, survey experts, topical experts), pretests, translation (Spanish), creating an online version (in Google docs), distributing survey (sending link to residents and stakeholders via e-mail), sending reminders, cleaning data, etc.

The research team organized multiple visioning workshops at Gateway Community College with the following objectives and activities: 1) Elicit responses to presumably contested value statements (survey and discussion based on expert panel results), including fleshing out vision elements and tensions between elements, exploring prioritization between vision elements, identifying tradeoffs between vision elements; 2) Identify spatially explicit areas of stability and change (mapping activity), including exploring what degree of change is desired and what that change could look like, and identifying specific locations for where change could occur; 3) Collect data on participant preferences for planning alternatives, including

land use functions, housing (building types, heights), mobility options (Street sizes and modifications), green infrastructure (landscaping options), and land use (civic spaces options); (4) Begin to synthesize visions for each identified area where change was desired, integrating the various ideas specific to the planning elements; and, (5) Collect data for vision narratives that would make the vision tangible and enhance the relevance of the vision to citizens. The preparation of the visioning workshops comprised of several steps, including drafting of workshop activities and material, reviews, facilitator training, run-through, dry-run, etc.

The construction of the initial visual preference survey was based on literature review and expert feedback. It compiled alternative photos specific vision elements that corresponded to and specified the values elicited through the visioning forums and the visioning survey. Participants were asked to comment on and prioritize the presented photos. The full survey construction comprised similar steps as were outlined for the visioning survey above. Later iterations of visual preference survey moved from photos to Photoshopped grey boxes in order to prevent participants from substituting opinions about photo aesthetics for the desired opinions about building height.

Analysis plan. Reinvent Phoenix analytical procedures included coding data from notes taken at workshop activity tables, statistical analysis, data interpretation, consistency analysis, sustainability appraisal (including target specification), and numerous visualizations (GIS mapping, priority mapping, etc.). The various analytical methods ensured that the resulting vision would adequately represent and summarize the elicited information, but also provide critical insights on how coherent and in compliance with sustainability criteria the vision is.

Results

During Reinvent Phoenix, five visioning reports (Wiek et al., 2012a; Wiek et al., 2013a; Wiek et al., 2013b; Wiek et al., 2013c, Wiek et all, 2014a) were produced using these methods and analyses, with ongoing iteration improving each successive report. These reports were provided both to the City of Phoenix Planning and Development Department as well as the U.S. Housing and Urban Development Department. The reports were used in concert with other grant products as inputs to the process of Duany-Plater Zyberk, who produced the eventual zoning and code updates approved by Phoenix City Council for inclusion in Phoenix's General as a template for future urban developments. Related to this dissertation, those reports and the corresponding events provided the first-hand experience that ultimately translated into the framework suggested on common challenges to initial stakeholder engagement and subsequent suggestions on a step-by-step process for facilitating effective initial stakeholder interactions. Table 1 enumerates the engagements and participants in each Reinvent Phoenix Transit District.

Table 1

Reinvent Phoenix Public Participation Data

District	Events	Participants
Gateway	6	81 (268)
Eastlake-Garfield	11	150
Midtown	6	148
Uptown	6	145
Solano	7	134
Total	36	658 (845)

(Survey results are parenthetical)

Based on the 36 events and over 800 participants engaged, the Reinvent Phoenix research team experienced some common challenges in their initial stakeholder engagement. A Google Scholar literature review of the "stakeholder participation" put those challenges in context, with some correlation between experience in the field and articulation in the literature. The discussion details common challenges for stakeholder engagement as experienced during Reinvent Phoenix, and as present in the literature.

Discussion

Common challenges for initial stakeholder engagement. Urban sustainability transition processes are ambitious, and require active, collaborative participation by various stakeholder groups. Thereby, meaningful and efficient engagement is a key ingredient for leading urban sustainability transitions. Conversely, deficient stakeholder engagement can lead to exacerbated power

asymmetries, distrust, low expectations, underrepresentation, and insufficient stakeholder participation, which can significantly hamper or even halt transition processes.

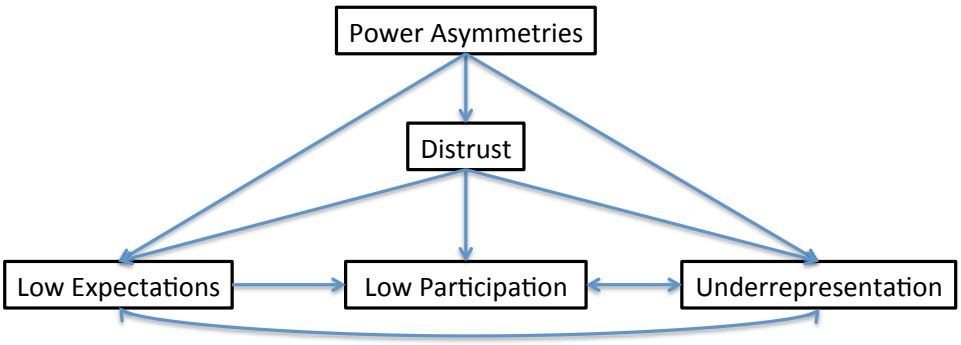

Figure 1. Common obstacles for initial stakeholder engagement for urban sustainability transitions

There are power asymmetries both between process initiators (e.g. planners) and the stakeholders engaged (e.g. citizens) (Arnstein, 1969), and among different stakeholders (e.g. residents and developers). Existing power asymmetries can seed a process with initial distrust, especially considering that developers often wield undue power (Gilens & Page, 2014). Given power asymmetries, stakeholders expect their participation to have little substantive impact, which, unfortunately, is often correct (Bickerstaff & Walker, 2005). Power asymmetry, distrust, and low participation all affect the representativeness of participants, because he less powerful or trusting a constituency is, the less likely to participate, making less powerful constituencies underrepresented. Similarly, power asymmetry, distrust, low expectations, and underrepresentation combine to drive low participation, which can invalidate a "participatory" process.

Power asymmetry. Power asymmetries between participants and professional planners are diagnosed (Hemphill et al., 2006), but the literature lacks effective practice for evening the playing field among stakeholders. Bickerstaff and Walker (2005) argue that: "decision-making involves conflict and partiality, and that attention to power relations and difference necessitates the acceptance of unresolvable disagreements" (p. 2139).

In urban public engagement settings, developers are often perceived to have much more power than neighborhood associations, which is confirmed in the literature (Gilens & Page, 2014). When participants feel disempowered by other attendees, they may be reluctant to contribute or feel that the process is contrived, with the outcome already decided. Effectively, the trade-off is that diversity within engagement events can mute expression of creative ideas outside the political economic discourse of the project, i.e. neighbors may not be willing or able to publicly combat developers and vice versa.

Distrust. Trust is scarce between participants in engagement processes and the bodies that initiate those processes (Walters et al., 2000; Halvorsen, 2003). Government employees often do not trust citizens (Yang, 2005), and the amount of control that experts have over engagement processes can be unclear. Experts generally initiate and facilitate engagement processes, collect and categorize data, and synthesize and implement results. The degree to which experts are perceived as controlling an engagement process is a central determinant of trust among participants.

Low expectations. With power asymmetries and distrust come low expectations, i.e. participants expect to have little influence on decisions (Shipley et

al., 2004). Unfortunately, low expectations are realistic, as participation often fails to have substantive impacts (Bickertstaff & Walker, 2005). This is especially prevalent when the initiating body "controls" the process, and thereby derives preferred or expected results (Few et al., 2007). Essentially, participants do not expect that their contributions have influence, and the evidence supports their perspective. This can happen for a range of reasons: planning professionals do not receive sufficient public engagement training during their education (Michaels et al., 2001; Shipley & Utz, 2012); the public often has different process and outcome needs than professional planners (Arnstein, 1969); organizers fail to build sufficient citizen capacity for informed input (Chipeniuk, 1999); and engagement processes lack effective mechanisms for incorporating stakeholder input. For example, stakeholder participation methods can lead only to organizers' preferred results: "reducing citizen engagement to a selection of 'menus'" (Reddel & Woolcock, 2004, p. 85).

Low representativeness. Participating families or groups sometimes look to only one voice, agreeing with whoever takes the lead. The opposite is equally challenging, as there will often be a variety of interests expressed, even by people from the same neighborhood (Uyesugi & Shipley, 2005). Some interests will be unrelated to the goals and potential of the planning process at hand, which can serve as a distraction and to alienate groups primarily concerned with a single issue. All these factors reduce the degree to which participants are representative of the population affected by planning projects.

Special efforts are often made to include broader representation of affected groups. Reinvent Phoenix was no exception, subcontracting St. Luke's Health Initiatives specifically to engage underrepresented groups (SLHI, 2013).

Unfortunately, such groups are most vulnerable to the challenges above, and planning processes generally fail to overcome the heightened barriers to turnout posed by underrepresented groups: "Language barriers, apathy, a lack of familiarity with government institutions (particularly the public planning process), prior negative interactions with such institutions, and a lack of time to attend public meetings can all be barriers to participation for members of disadvantaged or minority communities" (Lovell & Taylor, 2013, p. 1457).

Cultural sensitivity is extremely difficult to achieve in planning tools designed to reach broad audiences, because cultures have such large variability. Cultures can differ in hierarchical structures ranging across gender, age, and occupation, all of which affect likelihood, level, and content of participation. Language is an instructive example (Lovell & Taylor, 2013), as concepts in planning tools might not be easily translated. Translation is also resource intensive, requiring bilingual speakers as well as extra preparation and engagement time. Given that participation has decreasing marginal returns over the course of long engagements (i.e. interest and energy declines over time), translation should not be undertaken lightly. Generally, the better a planning instrument suits one cultural group, the less transferrable it becomes to other cultural groups. This is a central challenge for the place-based nature of sustainability science (Kates et al., 2001) and the context-specificity of transition arenas (Loorbach & Rotmans, 2010).

Low participation. Many factors can lead to stakeholder cynicism about turning out for engagement processes. Even stakeholders with positive attitudes toward participation often fail to behave accordingly, i.e. participate (Clary & Snyder, 2002). This may be partially due to socioeconomic barriers (Silverman,

2006), existing time constraints (King et al., 1998), and the low priority of participation relative to "essentials" (Iannaccone & Everton, 2004). Burnout is another common attendance barrier, as people become increasingly inured to participating in processes that fail to produce demonstrable benefits for them (Beebeejaun & Vanderhoven, 2010). At the other end of the spectrum, some stakeholders may be afraid to participate because of legal (e.g. immigration status) or cultural (e.g. gender roles) ramifications.

A step-by-step procedure for initial stakeholder engagement. The following procedure for initial stakeholder engagement for urban sustainability transition efforts is proposed. The primary goal of this guide is to assist people involved in such projects (e.g. planners, administrators, researchers, and community activists) with initiating stakeholder engagement processes, because planning education does not usually deliver this skill (Michaels et al., 2001; Planetizen, 2010; Shipley & Utz, 2012). However, when planners and researchers make themselves the nexus of communication and negotiation for diverse interests, they can leverage that position to promote and achieve synthetic solutions: "planners who exhibit the skills to conduct various kinds of civic engagement processes have substantial legitimacy among consultation participants and are respected for their contributions, even when the participants have criticisms" (Shipley & Utz, 2012, p. 32). Although the following is presented in an idealized linear progression, it is likely that many things will occur continuously, repeatedly, and/or in alternate orders.

Step 1 – Frame the process.

Who does what? The first step for the initiators of a stakeholder engagement effort is framing (Wiek & Iwaniec, 2014). Process framing details project goals, timelines, resources, geographies, and topical scope, accounting for economic and political realities. Effective processes will also frame stakeholder engagement as always offering more value to participants than burden placed upon them. One way that staff can offer value to stakeholders is by articulating a post-project strategy for relationship maintenance. The engagement team should internalize its orientation to participants, with scheduled dates to renew and review this commitment, to avoid prioritizing their needs above those of participants.

Engagement processes are complex, and scheduling is challenging, with various actors available at different times. Ideally, engagement staff schedules the date, time, and location of key events well in advance. At early events, materials help orient participants to the project, and its goals, timelines, and activities. Personnel should prepare business cards, maps detailing relevant geographies, and a 1—2 page document of the project narrative. The project narrative will start with goals, highlight key events, explain the value offered by participation at those events, and be explicit about how input will be analyzed, integrated into the project, and communicated back to stakeholders. Team members can practice the narrative until they are able to give a convincing, impromptu elevator pitch. Over time, articulation of the narrative will naturally change to suit the audience, context, and stage of the project.

Training will help maximize the efficacy of engagement materials. Training staff help cements the project narrative, establish political context, and anticipate

controversial topics and locations. Personnel familiar with stakeholders, geographies, and history can help bring less experienced team members up to speed and prepare them for early engagements. However, there is no substitute for lived experience, and regular visits to project geographies are extremely valuable for the perceived legitimacy of engagement personnel.

Justification. Framing a project from the perspective of value offered to participants specifically aims to bridge the Arnstein Gap between consultation and partnership, and to build trust in the process and its initiators. "Any serious discussion of process must begin by looking at both the participants' motivations for taking part in planning decisions as well as the motivation of civic officials in engaging the public" (Shipley & Utz, 2012, p.24). Most engagement exercises focus on the data initiators hope to collect, rather than on the people from whom it is collected. However, it is critical that participants perceive that their participation will benefit them, and offers an acceptable return on the time and effort invested. Investment in long-term continuity and relationship building offers more value to participants than discrete processes for specific projects.

Orientation to stakeholder value means sensitivity to the likelihood that potential participants have full lives (Iannaccone & Everton, 2004) and little free time (King et al., 1998). The earlier an engagement is on the calendar, the longer engagement staff has to market the event. Marketing drives momentum and participation, and early scheduling allows stakeholders to shape their schedule around key events, rather than vice versa.

At events, communication materials explain the project to participants, building trust, raising expectations, and increasing the likelihood of future

participation. Ideally a narrative document is simple, clear, and substitutes pictures and visuals for text wherever possible. The faster and more intuitively decision makers and stakeholders can glean central ideas, the more effective the document. The content of the narrative should include concrete, near-term pilot projects. The faster stakeholders see change on the ground, the more trust is built, the more participation is perceived as valuable, and the more people will want to participate.

Contextual knowledge lends credibility, as does honesty. The more the engagement team knows about the relevant area, key players, controversial topics, and political history, the more trust stakeholders will have in the authenticity of the engagement process. Similarly, openness and honesty about what is unknown will give participants the opportunity to fill in the team's gaps in knowledge, which builds trust as stakeholders feel ownership over the flows of information about their neighborhood, topic, institution, etc. Such training mitigates stakeholder distrust from being over-studied (Reed, 2008) or from expecting a simply extractive or consultative process (Wiek et al., 2012b).

Step 2 – Develop data collection tools.

Who does what? After establishing a project narrative, staff will have a sense for what data will be collected at various points during the process. Engagement settings can have a range of lengths and participants. However, early engagements (to which this chapter are confined) will often be in an interview or small group setting with key actors who offer access to larger networks. Staff preparing for these engagements can draw on informal interview methodology (Bernard, 2011a) and prepare forms to significantly improve data collection. The form will include contact information, location, and date, and questions both general (geographies and topics

of interest) and specific (technical, contextual). The end of the form will record subsequent contacts and to-dos (for both staff and participants) to review before adjourning. Engagement instruments should also be transparent (in purpose, product, and interpretation) and responsive to stakeholder feedback. When stakeholders quickly see evidence that they are heard (documentation online, updated products at future engagements, pilot projects, etc.), they are more likely to remain involved.

Justification. The data collection form helps guide conversations toward relevant areas, take targeted notes, generate subsequent stakeholders to contact (snowball), and confirm tasks with due dates before adjourning. Generating subsequent stakeholders to contact increases potential turnout and reach, even into underrepresented communities. Fun and satisfying engagement instruments incentivize participation and stakeholder retention. Instruments should tighten feedback loops so that participants can see the impact of their input within a reasonable time frame. This increases stakeholder trust in the process, the initiating institution, and the engagement personnel.

Step 3 – Contact key stakeholders.

Who does what? During list compilation and contact selection, engagement staff will need to apply project-specific criteria. All relevant data should be preserved in synthesis, and grouping by preferred contact type (drop-in, phone, email, etc.) can streamline early outreach. Prioritization is also necessary (Yang, 2014). Politics, network connectivity, or other concerns will necessitate contacting certain actors before others. The targets of the earliest efforts will generally be busy, well-

connected actors with past involvement in similar projects or relevant topical expertise.

Engagement staff can try to anticipate the rhythm of engagement based on past experience and accounting for planning fallacy (Buehler, et al., 2010). Initial contact should begin as early as possible, to account for long lead times before effective engagement. However, the trade-off with the preparation (materials, etc.) is important to manage carefully. In teams, initial contact responsibility should be apportioned strategically to team members with existing stakeholder relationships, geographic familiarity, or topical expertise.

The content of initial outreach should be the tight and succinct project narrative. Staff pitches will be short and focused on scheduling a face-to-face meeting. Flexibility to stakeholders' schedules, preferred meeting venues, and time available helps reduce burden on participants. If a meeting is scheduled by email, a short confirmation of time, date, and location makes for easy search later by a stakeholder. A confirmation call or email the day before a meeting can help avoid double-bookings and forgotten meetings.

Staff can aim to reach out to interest groups one at a time at the outset of a participatory process. Interviews, meetings, and presentations with a single stakeholder, or members or a specific group will help clarify the goals and interests of that constituency. The early stage of an engagement process is the best time to learn the diversity of values in play, which helps staff identify the ripest opportunity spaces for transition efforts and pilot projects.

Justification. Project specific criteria (Yang, 2014) can help address power asymmetry and low representativeness of contact lists. Seeking contacts from

underrepresented groups and communities without existing political articulation can help bring those constituencies into the process. Early identification of traditionally underrepresented stakeholders can help staff begin capacity building and refine the process to ensure inclusion of all stakeholders.

Engagement processes have a natural trade-off between complete preparation and starting early. For initial contacts, the earlier the start, the better, especially when engaging bureaucracies. In the early stages of a project, limited visibility can compromise initiators' ability to attract the attention of powerful bureaucratic actors. Additionally, the first point of contact at a bureaucracy might not be responsive or the appropriate point of contact. Yet, making sure powerful actors are represented is necessary to ensure they don't later politically "veto" a process in which they haven't participated.

However, smaller bodies can also take time to engage. Neighborhood associations might meet rarely (quarterly or less) and have agendas scheduled long in advance. Seasonal or annual fluctuations for businesses can impact their capacity for involvement. Individuals may be traveling, overburdened at work, or initially disinterested. Beginning initial outreach in tandem with preparation can improve participation, representativeness, and power asymmetry by giving engagement staff the time necessary to build relationships with all relevant stakeholders.

Events specific to interest groups in the early stages of engagement can help clearly articulate the goals of each group, leading to later negotiation by open-minded representatives of various coalitions. This gives underrepresented stakeholders, and those with less political power, the chance to be heard in an environment where they feel comfortable expressing their true opinions. Staff should

aim for this in-person contact because it is irreplaceable for building trust (Rocco, 1998).

Step 4 – Meet with stakeholders.

Who does what? In a first meeting, stakeholders will often be *much better informed* than engagement staff, which is why their input on a particular geography or topic is valuable. For initial meetings, team members should aim to make participants as comfortable as possible. Appropriate dress will vary, but should always remain professional.

Engagement staff can arrive early to setup materials (e.g. maps, one-pagers, note-taking forms, etc.) and review the goals for the interaction. When participants arrive, they will often need time to orient themselves, get a coffee, or wrap up a few emails in order to transition into being present for the conversation. Anticipating and welcoming this transition into the conversation builds rapport with participants. Once settled, inquiring about how much time the participant has helps to avoid unexpected early departures, allowing for final review of subsequent contacts and to-dos.

During early engagements, stakeholders should guide the discourse, with the most effective steering from staff being light. To help make participants comfortable, team members should listen attentively and actively, remain relaxed, and give ample time for the contact to feel heard before shifting the conversation toward the project. Once the stakeholder feels comfortable and opens up, the best information will emerge. As conversation picks up, participants should be able to track that they are heard through affirmations of "uh-huh" and nods. Mirroring body language (e.g.

leaning-in, gesticulating etc.) builds rapport (Iacoboni, 2009), but care is needed because it can be offensive if it is too obvious.

When describing the project, speaking slowly and clearly helps stakeholders process information in real time. Of course, it's likely that much of the time, a busy contact will want to jump right in, so staff should be prepared to move fast and/or cut engagement time in half. Language mirroring is usually safe, both casual and technical. If a contact slips into familiar acronyms (e.g. HUD, EPA), follow their lead. For clarifying questions, team members can use a contact's words, cadence, and emphasis to convey understanding.

Most importantly, engagement staff should affirm contacts' beliefs. Initial engagements should create a safe space for stakeholders of all interests to express themselves. General and parallel statements can show a contact that you're on the same team. Early engagements are not the place evangelize the beliefs, goals, or values of the initiating organization. People will often be more interested in the values at play than they are in the content (policy, plans, etc.). Authentic engagement means that contacts feel heard, understood, and *not threatened*. Once stakeholders feel heard, they are more willing for staff to steer them toward the information targeted in the data collection form.

If (when) they come up, staff should be forthcoming, honest, and empathetic about failings of earlier processes. These conversations are opportunities to build legitimacy through transparency about how past efforts have impacted and improved the current process. Staff can acknowledge the politics involved (to the extent possible), and the limitations of the current project. Commiseration about the past is the first step toward reorienting to the possibilities of the process at hand.

There is a trade-off between being fully present and taking notes. In some settings, bringing a second team member to take notes is appropriate. However, this will be contextual and difficult to anticipate, as people may be less open when their input is obviously recorded, i.e. some may prefer to be off the record or will be more guarded with their actual opinions. Finally, as an engagement slows down, it's time to generate and record subsequent contacts. Acquiring contact information during an engagement will remove the possibility of waiting on that data. After contacts are reviewed, team members can go over any upcoming events and to-dos (and their due dates) in the interview form.

Justification. Generally, for early engagements, building trust should trump the fidelity of notes or recordings, as making stakeholders comfortable should be your primary goal (Bernard, 2011b). Business casual is a good middle ground for attire, though it may be strategic to be more formal to meet with developers or business owners, and less formal to meet with blue-collar workers or underrepresented groups. This is the first step toward making a stakeholder comfortable, as what you wear impacts both your (Adam & Galinsky, 2012) and their (Dacy & Brodsky, 1992) behavior.

In order to build trust, the framing of early interactions must be to understand stakeholder perspectives, *not to change them*. Planning processes have certain goals and may not be able to address issues of serious concern to stakeholders. However, frankness about past process failures and current possibilities raises expectations for engagement process by setting the right boundaries. Making participants feel heard early helps elicit authentic opinions, attract interest in the project, and build trust in the process. When participation

offers the value of being heard, meeting with stakeholders also improves retention for future events.

During early engagements, snowballing contacts can improve the representativeness of outreach. When reviewing to-dos at the end of engagements, engagement staff should review both what stakeholders and they themselves have agreed to do, to draw on the power of reciprocity (Cialdini, 2009).

Step 5 – Produce an initial stakeholder sketch.

Who does what? Early preparation of the project narrative and timeline will guide the data collection strategy for the variety of data from early engagements: forms, notes, pictures, maps, etc. To the degree possible, anticipating the stakeholder sketch will help funnel incoming data into relevant issues, geographies, and stakeholder information. Collected data can then be analyzed to glean the key stakeholders, and their respective problem perceptions, visions, and potential strategies for the sustainability transition. This information should be captured in a sketch, i.e. a rough, quick, and timely breakdown of the key players, topics, and areas for the transition. The sketch can be as simple as a table, or can have more complex visual elements, but should be flexible to the context of the specific sustainability transition because "there is no single, most effective method" (Yang, 2014 p. 848) for stakeholder analysis and mapping. Flexibility is helpful, especially in the early going, as anticipation of what's needed will often be in error, and organically evolving data categorization and analysis will complement whatever is planned initially. Thus, the stakeholder sketch will should be a continuously updated database accessible to all team members.

Justification. Because urban systems are complex, sustainability has many dimensions, and circumstances can change quickly, a sketch (Buxton, 2007) of collected data is more time and resource efficient than a full-scale stakeholder map specific to each sustainability topic (e.g. Larson et al., 2013; Kuzdas et al., 2014). Urban sustainability transitions can happen at many scales, involving many actors, who are active across sustainability domains. Capturing the full picture of urban stakeholder relationships will rarely be possible in the time available for all but the largest and longest-term urban sustainability transitions. However, an approximation of the most important people and their interests is central to the success of a transition, and the level of detail of the most updated stakeholder sketch should be flexible to the transition at hand.

Table 2

How the Steps Mitigate Common Challenges for Initial Stakeholder Engagement

	Balances power asymmetry	Builds trust	Raises expectations	Improves representativeness	Triggers participation
Step 1 – Frame the process		by offering value to participants creates trust in the process and its initiators.	with strong narrative shows the value of participation, raising expectations.		Early scheduling gives more time to market events and lets people schedule around them.
Step 2 – Develop data collection tools		with responsive and transparent data collection tools that build participant trust.		Prepping interview forms to snowball contacts can help reach underrepresented communities.	Fun and satisfying events improve future participation.
Step 3 – Contact key stakeholders	by early individualized contact with all interest groups includes their voices and ensures communication is not impacted by in-room power asymmetries.			Flexibility to participants' needs helps underrepresented communities participate.	Early outreach can bring slow bureaucracies into the process.
Step 4 – Meet with stakeholders		Making participants feel heard early builds trust in the process.	Frankness about past process failures and current possibilities raises expectations.		
Step 5 – Produce an initial stakeholder sketch	by exposing gaps in outreach to less articulated groups	Build trust by showing participants they are part of the process.	Shows participants the scope of the project and who's involved.	Exposes gaps in outreach to less articulated groups	

Case study – Reinvent Phoenix. The U.S. Department of Housing and Urban Development (HUD) funded Reinvent Phoenix through the Sustainable Communities Program. The City of Phoenix' Planning Department administered the grant, for which they contracted an interdisciplinary team from Arizona State University's School of Sustainability. This team assisted with various stakeholder engagement efforts, including the creation of a stakeholder network in the initial stage of the project.

The goals of Reinvent Phoenix were to improve quality of life, conserve natural resources, and maintain desirability and access for the entire spectrum of incomes, ages, family sizes, and physical and developmental abilities around Phoenix's light rail. The grant was structured into planning, design, and implementation phases. During the planning phase, ASU worked with residents, business owners, landowners, and other stakeholders to articulate key sustainability challenges, develop sustainability visions, and prepare transition strategies (Johnson et al., 2011).

The design phase took its cues from public participation in the planning phase, through ongoing contact with Transit District Steering Committees to ensure accurate translation of vision reports (e.g. Wiek et al., 2012a) into policy and regulations. The design team produced plans for canal activation, complete streets, and form-based code, which complemented a toolbox for public-private partnerships aimed at stimulating economic development in the light rail corridor. These technical products will become city-council approved general plan zoning, codes, and regulation updates, as well as influence other city policies that leverage the initial public investment in light rail.

Reinvent Phoenix public participation took place in a variety of engagement settings, ranging from interviews, to project-specific events, add-ons to existing events, and an online engagement portal (Wiek et al., 2012a). Data from Reinvent Phoenix were captured primarily by note-takers at events and interviews.

Initial stakeholder engagement for Reinvent Phoenix.

Step 1 – Frame the process. Reinvent Phoenix's framing included the goal of rezoning (among others), a three year grant timeline, five specific geographies (Transit Districts), six planning elements, as well as economic, city staff, and partner resources (Johnson et al., 2011). Initially, the project narrative was articulated for both academic and general audiences. Arizona State University's School of Sustainability hosted two graduate level workshop courses to train interdisciplinary students to facilitate public engagement events.

Step 2 – Develop data collection tools. Data collection forms evolved over the project, with early engagement in later Transit Districts benefitting from the experience of previous efforts. Interview forms shifted from question- to theme-based and better anticipated engagement's focus on key stakeholders, issues, and geographies.

Step 3 – Contact key stakeholders. Reinvent Phoenix contact lists came from previous light rail outreach, the Neighborhood Services department list of neighborhood associations, and Local Arizona First members. Initial meeting scheduling and materials preparation were simultaneous, so that the project narrative and supporting maps, etc. were ready for early outreach. Overall, a rhythm of engagement emerged in which initial calls and emails would engender meetings about two weeks later. Those meetings would catalyze a second wave of

outreach, with meetings again two weeks later (a month or more from the process's beginning). Those first points of contact helped market the project to potential participants. Over time, ongoing contact and communication opened pathways to larger groups and organizations, with access to their meetings and events (Wiek et al., 2013b). Usually, becoming an agenda item at someone else's event would take one cycle: "not this week/month, but the next".

Step 4 – Meet with stakeholders. Each Transit District was assigned a graduate student stakeholder engagement lead who was responsible for all stakeholder meetings, data collection, and inputs for the stakeholder sketch. These leads reported to the Senior Research Team (the Principal Investigators and research assistants) weekly to discuss outreach strategies and collected data. Initial stakeholder meetings in Reinvent Phoenix were generally in an interview or small group setting, with occasional presentations to organizations in order to schedule such interviews. The interviews always took place off campus, at locations based on the convenience of participants. The key stakeholders, issues, and geographies emerged as the most crucial data for orienting engagement tools to be used later in the process, and Senior Research team meetings often focused on how the ingredients of the stakeholder sketch could best inform those future tools.

Step 5 – Produce an initial stakeholder sketch. Each stakeholder engagement lead produced a stakeholder sketch of their Transit District. The sketches were multidimensional and shifted week to week. They primarily consisted of a list of engaged stakeholders and the emergent key players, issues, and geographies. The sketches were crucial for informing the subsequent events in later stages of the stakeholder engagement process. Instead of asking participants at later events to

consider the entire Transit District, the stakeholder sketches allowed the Senior Research team to refine engagement instruments so that they primarily addressed a Transit District's emergent issues and geographies. Additionally, identification of key stakeholders supported later transition strategy creation and informed the membership of the Transit District Steering Committees tasked with shepherding those transition strategies.

Achievements and shortcomings of initial stakeholder engagement for Reinvent Phoenix.

Step 1 – Frame the process. During Reinvent Phoenix, consistent marketing of the Transit District Steering Committees as the mechanism for post-grant civic participation built crucial relationships with key stakeholders. Maps were the strongest communication assets at the beginning of the project, as ASU and City of Phoenix graphic design staff visualized grant geographies that facilitated place-specific stakeholder input (Wiek et al., 2012a). However, Reinvent Phoenix's project narrative was slow to crystallize the connectivity between the six planning elements, and slow to saturate consistently among project subcontractors and partners. Parallel city planning processes (e.g. a concomitant citywide stakeholder engagement process for a general plan update) and some with similar branding "Phoenix Renews" conflated public understanding of the goals and purview of Reinvent Phoenix.

Step 2 – Develop Data Collection Tools. Early engagements in later Transit Districts better leveraged interview data than those done previously in the grant (Wiek et al., 2014a). When developing digital tools, collaboration with app developers in Arizona State University's Designing Health Lab reoriented surveys

from data collection to narrative construction, which increased their reach (Wiek et al., 2013c). However, timing initial outreach for transparency of input and maintenance of momentum was challenging. The Transit Districts engaged in the middle of project had large gaps in contact between initial efforts and the final design workshop, which was nearly a year later for some Transit Districts.

Step 3 – Contact Key Stakeholders. The balance between material preparation and the pace of outreach under Reinvent Phoenix was sufficient to engage over 800 citizens across five Transit Districts, even under the constraints of only three months of planned participatory processes per Transit District. Synthesis and centralization of contact lists was slow, as many contacts had incorrect information, or were only available through one mode of communication, which was not clear from received lists. However, Reinvent Phoenix's centralized and organized contact list is now the starting point for subsequent engagement about the next generation of transition efforts.

Step 4 – Meet with stakeholders. Early meetings with Reinvent Phoenix stakeholders helped the Senior Research Team determine gaps in outreach to relevant constituencies, and enlist the aid of grant partners to ensure appropriate representation on the Transit District Steering Committees. These meetings built trust between stakeholders and the ASU team, and helped improve participation at later events, which were well attended by stakeholders who were contacted early in the process. Crucially, early conversations with stakeholders oriented later engagement tools to the issues particular to each Transit District, such as parking (Wiek et al., 2013b) or vacant lot development (Wiek et al., 2012a), as well as to the geographies of importance for each Transit District, such as the Van Buren Street

corridor (Wiek et al., 2013c) or the corner of 19th Avenue and Camelback Road (Wiek et al., 2014a). However the grant's aforementioned time constraints limited the breadth of initial stakeholder contact, a shortcoming the Senior Research Team discussed and plans to ameliorate in similar efforts in the future.

Step 5 – Produce an initial stakeholder sketch. The initial stakeholder sketches produced in Reinvent Phoenix guided subsequent engagement tools used in workshop settings with the public. Knowledge of which corridors, corners, and parcels to highlight offered specificity to the stakeholders at those later workshops, making the time they invested more efficient. Similarly, the sketches narrowed the sustainability conversations to the topics with the most interest, and the least consensus. During later workshops, this empowered the ASU team to anticipate and facilitate stakeholder negotiation of the most controversial topics, such as building height or owning vs. renting (Wiek et al., 2013a). The stakeholder sketches also became the backbone of the Transit District Steering Committee selection process, with many of the identified key players becoming active champions for transition strategies as Committee members.

Conclusions

The steps above are the proposed answer to the research question: What is a sound process for initial stakeholder engagement? They detail the logistics, content, and products of initial stakeholder engagement necessary to support urban sustainability transitions. Based on extensive experience under Reinvent Phoenix, this process helps fill a gap in planning education with step-by-step ways to smooth power asymmetries, build stakeholder trust, raise expectations, improve representativeness, and increase participation (Table 2).

Reinvent Phoenix is an instructive case study of an institutionalized planning exercise partnering academics with municipal employees. For the success of such partnerships in the future, the lessons learned from this case have been collated to produce best practice steps. Those empirically grounded steps offer the stakeholder sketch as a way to fill the gap between the exhaustive and time-consuming stakeholder analysis and mapping aspired to in the literature, and the time constrained complexity of urban sustainability transition projects.

Limitations. This research was conducted under the time constraints of three months of stakeholder engagement per Reinvent Phoenix Transit District, determined by the City of Phoenix and HUD. This time horizon did not allow for full development of potentially productive stakeholder relationships, or for complete coverage of relevant geographies and constituencies. Similar, ongoing, City of Phoenix outreach was often misunderstood and communicated during Reinvent Phoenix activities. Further, the initial relationships to be leveraged into the stakeholder engagement process were held by the City of Phoenix, and were unfortunately possessed of inaccurate and incomplete contact information, as well held back by city staff who worried about how outside engagement might impact those relationships.

The research products of this study were not anticipated before the project, and therefore, data collection could have been better connected with analysis. The steps were created based on correspondence with the challenges in Reinvent Phoenix, the literature, and the best practices developed under the project. However, they could evolve and improve with subsequent empirical examination within other projects and case studies. Overall, it is best to think of this work as hypothesis

generating (i.e., the steps articulated) as opposed to hypothesis testing in that the data were not organized in such a fashion to test *a priori* hypotheses. The series of steps could be considered a first draft hypothesis on how to do early engagement of transition agents. It is highly likely that the suggestions will need to be adjusted for new contexts, and refined as they are used in those contacts, hopefully with results reported in the literature to support subsequent practitioners.

Future research. Future research in this space can use these steps as a draft hypothesis to be evaluated. Each step deserves more in-depth individual treatment, with care paid to the trade off between specificity to context and transferability of knowledge. Researchers can continue to orient stakeholder techniques from other disciplines, or focused on single topics, to the middle and late stages of participatory processes. Finally, the overall framework of evidence-based urban sustainability transition efforts is an emerging field, with many opportunities to improve transition management and outcomes.

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Chapter 3

Evaluative Criteria for Urban Sustainability Transition Arena Decision-Making

American cities face many sustainability challenges, and transition arenas have arisen as a model for managing transformation from the present into more sustainable visions of the future. Transitions are complex, multi-scale processes made up of many individual decisions. This chapter offers criteria that evaluate: 1) who participates in a transition arena, 2) in what setting they interact, and 3) how that interaction takes place. These criteria use the vantage point of individual decisions to provide a platform for agile iteration as urban sustainability transitions mature from one decision to the next.

American urban development faces many sustainability challenges. Existing land use has negative impacts on public health (Frank et al., 2006). Automobile infrastructure has been prioritized (Newman & Kenworthy, 1999) above alternatives that improve health (Pucher & Dijkstra, 2003) and reduce emissions (Lindsay et al., 2011), such as walking, biking, and transit development. Developers (i.e. members of the economic elite) have more influence over policy, and thereby development often prioritizes developer over other citizens (Gilens & Page, 2014). Such private development interests have trumped investments in public space, resulting in circumstances such that:

> public spaces are no longer, if they ever were, democratic places where a diversity of peoples and activities are embraced and tolerated. Instead, they have become centers of commerce and consumption, as well as places of political surveillance. (Low & Smith, 2013, p. vii)

Further, preoccupation with economic development has marginalized concerns about social justice and/or social services (Fainstein, 2001). Finally, urban

environmental sustainability challenges manifest in many systems, such as stormwater (Barbosa et al., 2012), urban forestry (Conway et al., 2011), and air quality (Elsom, 2014), among others.

Transition arenas have the potential to host sustainability transitions that move cities from these unsustainable states in the present to desirable, more sustainable states in the future (Nevens et al., 2013). This chapter relies on Rotmans et al.'s (2000) definition of a transition: "a gradual process of societal change in which society or an important subsystem of society structurally changes" (p. 19), and Nevens et al.'s (2013) definition of a transition arena: "the actual initial incubators of change; they are crewed by local frontrunners that are considered as engaged visionary people with diverse backgrounds" (p. 111).

The transition arena concept, as discussed here, arose around a national sustainability energy transition in the Netherlands (Kemp & Loorbach, 2003), but transitions can happen at many scales, such as regional (Vandevyvere & Nevens, 2015) or urban (Nevens & Roorda, 2014). Urban transitions will often have smaller transitions nested within larger efforts (Nevens et al., 2013). Therefore, transition arenas might overlap, or contribute simultaneously to multiple transitions. This complexity contributes to what Nevens et al. (2013) describe as the multi-scale conceptual challenge:

> Politics and governance dynamics are complex and transcend system (or sectoral) boundaries. Accordingly, dynamics of urban sustainability transitions need to be investigated in multiple scales in order to understand the embeddedness of transformation processes in space (p 113).

To address the multi-scale conceptual challenge for urban transitions, the transition research community has used transition management:

> a deliberate attempt to bring about structural change in a stepwise manner. It does not attempt to achieve a particular transition goal at all cost but tries to utilise existing dynamics and orient these dynamics to transition goals that are chosen by society" (Rotmans & Kemp, 2003, p.15)

In cities, transition management can take place in "Urban Transition Labs" (UTLs) (Nevens et al, 2013), which host a transition team that feeds information to a city's various transition arenas for different places, issues, and scales. In Europe, Ghent had some success installing a UTL (Nevens & Roorda, 2014), and San Francisco, CA has what might be considered a reasonable proxy in its Department of Environment (Wiek et al., 2015). However, many cities lack a centralized and defined UTL, leaving the "Involved Actors" specified by Nevens et al. (2013) to collaborate in emergent transition arenas, rather than their defined hierarchy of UTL, transition team, and subsidiary transition arenas. Thus, this chapter compresses the hierarchical taxonomy of UTLs back into the simpler conceptual structure of "transition arenas," in order to match the context of most American cities.

As work on urban sustainability transitions matures, it is critical for researchers and practitioners to move beyond defining terms and conditions, to iteratively developing and validating the most effective processes for initializing and supporting successful transitions. Presently, "analytical rather than an action focus dominates the urban transition scholarship" (Nevens et al., 2013, p. 113), and transitions aspire to take place at the scale of "long term vision guided sustainability trajectories" (Vandevyvere & Nevens, 2015, p. 2418). Unfortunately, however, these generational scale concepts do not necessarily support effective, iterative development and validation of the components of an intervention (Rotmans & Loorbach, 2009). Based on this, more immediate proxy metrics of success for each

individual transition arena, and in particular, each decision that might progress a transition, are largely lacking from the current literature.

To contribute to the field, this chapter collates criteria that can be used to evaluate specific decisions within urban sustainability transitions. Urban transformation can sometimes hinge on a single decision, and evaluative criteria can both assess past decision environments and be applied to design future decision environments. This work borrows several concepts from the health behavioral science field, particularly on the study of what is being labeled, "Just in Time Adaptive Interventions" (Nahum-Shani et al., 2014; Nahum-Shani et al., 2015).

Just in time adaptive interventions (JITAIs) are targeted interventions that support an individual engaging in more positive behavioral patterns (e.g., living a healthier lifestyle via increased physical activity or reduced alcohol consumption). Pertinent to transition interventions at a societal scale, the purpose of a JITAI is to identify the moments (in the JITAI literature, these are labeled "decision points") when a more favorable behavioral option is possible. The purpose of the JITAI then is to intervene at that given decision point by providing the most appropriate intervention for the target individual within context.

To do this, the JITAI includes two core concepts, that the intervention is delivered "just in time" (JIT) and that the intervention adapt over time to the changing needs of an individual. The concept of a just in time moment includes two broad concepts: 1) that a person is in a state of opportunity to engage in a more positive behavioral option (e.g., a person just missing a bus but then choosing to walk to the next station to get some extra steps rather than simply sitting and waiting) or vulnerable to an undesirable option (e.g., an individual with alcohol

dependence in a bar is vulnerable to drinking); and 2) that the target is receptive to the type of intervention provided, meaning that the individual (in the case of a JITAI) is open to receiving the intervention, capable of processing it, and willing to act upon the intervention.

A JITAI systematically adjusts its support for those that meet the criteria of being delivered JIT and are found to be producing positive outcomes. A final concept that is informative from the emerging JITAI literature is the distinction made between proximal vs. distal outcomes. Distal outcomes are the final desired outcome of a process (e.g., for an individual, a long life with limited to no functional disability is a particularly distal outcome). Proximal outcomes are the more short-term and, ideally rapidly measured outcomes that ultimately contribute to the emergence of the distal outcome. Returning to the individual health example, this could be walking 10,000 steps per day or eating a healthful diet at each meal.

Returning to the transitions arena concept, this chapter assumes that the complex systems that transition arenas are meant to target ultimately include a wide range of smaller "decision points" nested within these complex systems. It also assumes that these decision points occur both via an active deliberative process (e.g., the organization of a UTL) and more via happenstance (e.g., a decision needs to be made and developers are called to make the decision on an "as needed" basis). A central goal of this paper is to better identify these "just in time" decision points for transition arenas and to then articulate a first draft set of evaluative criteria that might be used as "proximal outcomes" for defining relative success and failure for any given transition arena. The purpose of this careful definition of the proximal outcomes is to enable more systematic evaluation of interventions used at the

macro-scale to create an accumulative knowledge-base about best practices for supporting transitions to more sustainable urban environments. As there has been very limited research on defining these proximal outcomes, the proposed evaluative criteria below are only a logical first draft that must be iterated upon. That said, previous literature does provide some preliminary guidance for defining these criteria. As such, the remainder of this chapter defines proximal outcome evaluative criteria for transition arena decision points based on the previous literature.

Transition arenas are often described as networks of actors (Van de Kerkhof & Wieczorek, 2005; Loorbach, 2007). However, they are more accurately conceived as those actors, the institutional settings that facilitate their collaboration, and the tools used for that facilitation. This chapter therefore collects criteria for transition agent selection, transition arena settings, and transition arena decision making facilitation tools, which can be applied to both evaluate specific decisions within transitions, and design decision environments. Thus, the research questions of this chapter are: 1) What are appropriate domains to focus on for measuring and defining the success of specific decisions (i.e., the proximal outcomes) within urban sustainability transitions based on the previous literature?; and, 2) What is a logical structure to support the design of effective urban sustainability transition arena decision-making environments? For the structure of a decision within an urban sustainability transition arena, an underlying goal is to develop criteria similar to those articulated for defining a just in time decision point for individuals (i.e., state of opportunity/vulnerability and state of receptivity of an individual) but with the necessary conceptual and methodological changes that are required for targeting a transition arena (e.g., better articulating concepts such as who, what, when, where,

and how individuals should interact to enable an effective decision at any given transition arena decision point).

The chapter is structured as follows. The next section lists criteria for selecting the people who make up a transition arena, which is followed by criteria for evaluating a transition arena's setting. Next, there are criteria for specific decision-making environments, then discussion of possible measurement instruments for each set of criteria, and a table that condenses the preceding criteria for ease of reference. Finally, the chapter concludes with discussion of application of the criteria and how they might be used to anticipate and design effective transition arenas.

Criteria for Urban Sustainability Transition Agent Selection (Who)

Sustainability transitions can happen at a variety of scales and complexities, but successful efforts will have similar inputs (Farla et al., 2012). The central input to successful sustainability transitions is people, namely the participants in a multi-actor transition arena (van de Kerkhof & Wieczorek, 2005). The literature calls for arenas to be populated by "frontrunners" (van der Brugge et al., 2005) or "forerunners" (Loorbach & Rotmans, 2006), both of which terms are rendered here as "transition agents." This chapter defines "transition agents" as the actors who carry out a transition, and uses "transition agents" instead of "frontrunners" or "forerunners" to communicate more inclusivity in potential participants over the generational time frame of transitions as transition arenas do not simply include the initial drivers or "early adopters" of an idea but must, by design, incorporate the targeted populace.

Ideally, these transition agents would emerge from a robust stakeholder engagement process that identifies representatives from the diversity of relevant

interests who best meet the criteria listed below. Of course, these criteria are ideals, and can likely only be partially met. Some criteria will nearly always compete with one another (e.g. representativeness and collaborative capacity), and appropriate balancing among the criteria likely will be contextually defined for specific transition arenas.

In that example of representativeness and collaborative capacity, diversity is crucial to make sure all the ideas and interests relevant to the transition arena are included. In concert, collaborative capacity is realized in the type of interactions that mediate the dissent and conflict that will be present in any group representative of the diversity in an urban system (Foster-Fishman et al., 2001). Collaborative capacity represents the potential of transition agents to empathize with each other's viewpoints, and discuss them in an absorptive fashion, rather than the status quo of quid pro quo interactions in polarized or partisan democratic environments (Foster-Fishman et al., 2001).

Representativeness. Transition agents should ideally represent the diversity of constituencies in the geography where the transition will take place (Rowe & Frewer, 2000; Rowe & Frewer, 2004). Ideally, ages, ethnicities, religions, socioeconomic statuses, and other demographics are proportionally represented in initial stakeholder engagement (van de Kerkhof & Wieczorek, 2005). Similarly, the diversity of values and interests affected by a transition should be present in the transition arena (residents, visitors, business owners, landowners, etc.). Finally, diversity within constituencies is desirable, such that a range of incomes or other differences (e.g., corporate and independent businesses) are represented. Meeting these criteria helps articulate the diversity of relevant perspectives, build credibility,

and disseminate products widely (Avelino, 2009). For example, a transition arena for the transportation sector might benefit from the perspective of older residents using Dial-a-Ride (federally mandated disability service), as well as from youth taking city buses to schools, and middle-aged commuters who currently depend on cars. Similarly, business and land development plans would be relevant to where transportation nodes should appear, as well as existing tourism or entertainment destinations. Without a broad range of representation, a transition arena is likely to offer a narrow focus and engender opposition from the underrepresented constituencies as well as result in sub-optimal solutions that do not balance the needs of the constituents.

Collaborative capacity. Transition agents should meet the criteria of collaborative capacity and be willing to engage the ideas and values of fellow agents (Loorbach & Rotmans, 2006; Nevens et al., 2013). This chapter uses Foster-Fishman et al.'s (2001) definition of collaborative capacity: "the conditions needed for coalitions to promote effective collaboration and build sustainable community change" (p. 242). Foster-Fishman et al. (2001) go on to list many specific skill/knowledge sets, grouped as

- Member Capacity: e.g. "committed to collaboration as an idea" (p. 244)
- Relational Capacity: e.g. "participatory decision-making processes and shared power" (p. 244)
- Organizational Capacity: e.g. "effective internal communication system" (p. 245)
- Programmatic Capacity: e.g. "clear, focused programmatic objectives" (p. 245).

Because the diversity of values involved with a transition can be divisive and controversial, early stakeholder engagement in the lead up to transition agent selection should attempt to glean the perspectives of homogenous groups (e.g. specific neighborhoods, or developers). Once those interest groups have been heard, the transition manager(s) can "thoughtfully include" (Johnston et al., 2010) transition agents with the most collaborative capacity to represent their respective homogenous groups. Collaborative capacity of transition agents is crucial for building trust in each other and the process (Yang, 2005; Basile et al., 2012), as well as negotiating opportunity spaces amenable to the diversity within the agents. For example, collaborative capacity helps build trust by thoughtfully including new participants at the appropriate pace and with sufficient orientation to the transition arena. Imagine working with a new group of busy people who use unfamiliar technical language. Collaborative capacity in such a group would include an onboarding procedure with a glossary and time set aside to answer the questions of new participants. These collaborative processes form the foundation of a working environment that could support participatory decision-making and clear communication and objectives.

Knowledge. Sustainability transitions often require contextual expertise, such as local knowledge of geography, environment, culture, and history, etc. (Brundiers et al., 2013). These different knowledge domains are as crucial as more commonly leveraged technical expertise (e.g.) architecture, planning, and law, etc.), because the success of transitions is contingent on deep contextual knowledge. By combining technical with locally relevant knowledge, urban sustainability transition arenas can find community supported and feasible opportunity spaces for

interventions that support the overall transition. For example, a transition to better urban air quality with a tree and shade plan might require knowledge of local plants, the history of regional climate, and the risk of pests and diseases. These factors might be just as important as the aesthetics envisioned by landscape architects and complying with city setback and landscaping regulations.

Skills. Transition agents should have the skills necessary to carry out the goals of the transition (Jhagroe & Loorbach, 2014). Relevant skills will differ with the scale and context of the transition, but tautologically, there should be transition management capacity among the transition agents (Loorbach & Rotmans, 2006). Similarly, for sustainability transitions, sustainability competencies in norms, anticipation, systems, strategies, and interpersonal skills will be required (Wiek et al., 2011). Finally, facilitation skills, defined as the skills needed to enable "groups or teams to work effectively together to achieve a common goal" (Kitson & Harvey, 2015, p.71) will be required for effective decision-making in any transition arena (Loorbach, 2007). As transitions mature, transition agents may recognize the need for new skillsets, which will either bring new agents into the arena, or lead to contracting for required skills on an as-needed basis. To illustrate, let's return to our urban air quality tree and shade transition example. In that transition arena, skills in the sustainability competencies would help establish landscaping norms, anticipate potential invasive species or disease pitfalls, define the irrigation systems needed to support new plantings, build strategies to increase canopy cover, and work with partners to complete the transition. In this example, facilitation skills could enable arborists, landscape architects, landowners, residents, and the water department to work effectively together in the transition arena.

Influence. Transition agents should have, or create, enough influence to complete the transition. This chapter defines influence as: the relationships, communication, and power required to complete a transition. Without influence, transitions are doomed to rhetoric without impact (Rowe & Frewer, 2000). Governments (Rotmans et al., 2001) often have a large role to play in transitions, but if influence is lacking, new transition agents may need to be recruited for the arena. However, political power is a delicate balance with representation (Gilens & Page, 2014), and strong facilitation skills may be necessary to mediate between powerful vs. less well-represented interests. The more influence a single transition agent has, the more important it is to facilitate democratic participation across the arena to ensure that all perspectives are fairly represented and not just the most influential voice. For example, imagine a representative, collaborative, knowledgeable, and skilled transition arena focused on regional transportation. How likely would success be if the arena had no influence with local or regional government, their likely subcontractors, and the owners of land where new transportation was desired? On the other (likely more common) hand, imagine influential actors choosing the locations of regional transportation without representation, collaboration, interdisciplinary knowledge, and the skills described above. This is reminiscent of the status quo, and, indeed, might propagate problems of wealth inequality via the urban form, much like citing of polluting industries (Boone et al., 2014).

Summary. Overall, effective transition agent selection should produce a transition arena that is representative, collaborative, knowledgeable, skilled, and influential. Again, these criteria are ideals, can likely only be partially met, and

need to be balanced based on the context of specific transition arenas. However, if too few of these conditions are met, it is unlikely that transition success will occur, thus making the value constructs to define as proximal outcomes for any transition arena. In such cases, new transition agents may need to be recruited to the arena, or a transition may benefit from delay or cancellation to conserve what would only be wasted resources. Returning to the just in time concept as an analogy, the right players largely provide the preconditions for success. While future work needs to determine just how important each of these are as pre-conditions (and indeed, explore if they can be actively manipulated in a non-ideal transition arena), these first draft concepts can help better diagnose the reasons why some transition arenas succeed whereas others fail and also provide an initial proximal outcome for success when teams of transition agents form.

As selection of transition agents is only a pre-condition, it is necessary but by no means sufficient for the creation of a transition arena. A transition arena also requires a setting in which transition agents interact. Assuming a good balance of transition agents that meet the above criteria are assembled, the next area of evaluation for the transition arena is to example the setting for supporting collaboration.

Criteria for Urban Sustainability Transition Arena Settings (What, When, Where)

Urban sustainability transition arenas include not only transition agents, but also the settings in which they interact. Elements of urban transition arena settings include: what the interaction is about (the topic/purpose), and when and where

interactions take place. To create successful transition arenas, the following criteria can be contextualized and applied for transition arena settings.

Transition purpose. The first criterion for a strong transition arena setting is clarity of purpose: what are the goals of the specific transition (Frantzeskaki et al., 2014)? When recruiting new transition agents to an emerging transition arena, the prior transition agents will have to specify, negotiate, and evolve the purpose of the transition. To illustrate, an example distal transition purpose might be a generational shift from a primarily automobile-dependent transportation system to a multi-modal system. A more proximal transition purpose could be the passing of an ordinance that increases alternative transit options beyond just automobiles in a given city/region.

Transition boundaries. Boundaries specify the focus of the transition, and should also be established as early as possible. This chapter defines boundaries in the transition arena context as the limitations on the scope of the transition's purpose. The most familiar boundaries for urban transitions will often be geographic, such as cities or regions (Nevens et al., 2013). However, boundaries for the sectors, scale, and timeline of the transition are also important (Bos et al., 2014). Some transitions might be very large-scale such as national or even international policies related to climate change and climate neutrality (Nevens & Roorda, 2014). For these types of transition arenas, the players are often representative of other large organizations (e.g., various presidents and dignitaries representing their countries).

While large-scale boundaries are important, this chapter acknowledges, and indeed emphasizes, the importance of much smaller scale boundary areas as logical

proximal targets for change. The reason for this target is that it is often far more valuable to achieve a series of small transitions that accumulate into a larger effect compared to trying to achieve everything within a single transition. For example, tree canopy cover in a single neighborhood is a small step that could lead to reduced heat sinks within hot urban desert landscapes such as Phoenix, AZ (Bernstein et al., 2014). Further, these relatively micro-boundaries (e.g., neighborhoods within a city vs. an international treaty) often play a smaller, but still impactful, role in the complex system for defining sustainability targets. As such, careful articulation of boundaries for a given target but also how these different boundary groups (e.g. neighborhoods, cities, regions, state) co-interact and influence each other can provide valuable insights for finding and articulating decision points at various scales.

Further, these boundary conditions do not just need to be geographic but could also include sector (e.g., government vs. private industry), scale (e.g., household vs. citywide), and timeline (e.g., 1 vs. 10 vs. vs. 20 vs. 50 years). Taken in aggregate, these boundaries define the core transition actors at a more macro scale and help to identify the key individual players that need to be involved (i.e., the preceding criteria) and also help to support mapping of the complex system involved in impacting something as long of a timescale as a generational shift towards reduced automotive transportation. This careful mapping then can aid in identifying and better articulating the just in time transition decision points that can be used to shift micro- to macro-scale actors towards more sustainable conditions.

Rules. Transition arena settings should have straightforward rules that empower transition agents of all knowledge domains to articulate their positions

(Avelino, 2009). Rules should be established at the earliest possible interaction, and revisited throughout the transition process using interactive process design (Edelenbos & Klijn, 2005), because context, as well as who participates, can change. Rules should be transparent (van de Kerkhof & Wieczorek, 2005), and designed to smooth any power asymmetries in the transition arena. For example, if there are votes to be made, apportioning of votes should be determined early, and negotiated to the satisfaction of the transition agents. Some arenas will award votes per person, others might use proportions based on geography or population. Civility is crucial for collaborative capacity and rules about transition agent interaction should define what level of civility is required (e.g. restrictions on profanity, rebukes for ad hominem attacks, etc.).

Inputs to and/or products of transition arena setting. For different transitions, transition agents might coalesce into an arena at different times. For example, a transportation transition away from automobile dependency might begin with transition agents involved with bike lane and transit-oriented development, but later bring in new transition agents with experience building rail lines. Sometimes, most of the necessary transition inputs will exist (e.g., the purpose and vision of the transition are clear), and will be part of the setting for transition agent interactions. Other times, transition agents will evolve into an arena and need to create the following products for their urban sustainability transition.

Defined and assessed sustainability problems. Transformational sustainability research uses a transdisciplinary methodology that draws on participatory action research to develop current state assessments, visions, and transition strategies (Wiek & Lang, 2014). This means that a central focus of the

work is on engaging all relevant stakeholders into a process of assessing the current situation, defining a common vision for the future, and then articulating concrete strategies for achieving these goals. This methodology is appropriate to the needs of urban sustainability transitions, and helps define and structure sustainability problems in the current state (Wiek et al., 2007). Problem definition should be the subject of early transition agent interactions to produce a consensus understanding of plausible areas for starting the transition. Then, they can develop criteria to assess the sustainability of those current state problems (Talwar et al., 2011), which helps prioritize what to tackle first in the transition.

As suggested by Hekler et al. (2015), there can often be a wide range of competing definitions of problems, visions/goals, and strategies/solutions to a given problem. Based on the difficultly of problem definition (but also the essential utility of understanding the problem being tackled), a logical strategy for defining the problem can often involve carefully exploring, at multiple scales and boundaries, where transition agents may be able to agree on fundamental problems. These can start from the large-scale and abstract issues such as values (e.g., we can all agree that crime should be reduced) to micro-issues (we can all agree that potholes are a problem in this part of town). A central task for problem definition involves a curated discussion that carefully attempts to find the right boundary/scale for a problem that the transition agents can agree to work on together. To return to the transportation system example, a macro problem might be lack of access to public transit, which could be assessed using geographic information systems to determine the percentage of citizens living in the walk sheds of bus and transit stops. However, transition agents may wish to address this problem at a variety of micro scales,

using different strategies where appropriate. For example, a citywide increase in the percentage of citizens living in such walk sheds could be achieved by creating more bus and transit stops, developing more housing near existing stops, and expanding walk sheds with circulators.

Desirable sustainability visions. Armed with the purpose of the transition and assessments of defined problems in the current state, transition agents can explore desirable visions for the future (Loorbach, 2010). These visions articulate a future where the purpose of the transition has been achieved. Wiek and Iwaniec offer 10 quality criteria (e.g. systemic, coherent, plausible) for such visions, which shape them into effective evaluative criteria/inputs for judging sustainability transitions (2013). Together, current state assessments and visions reveal the gap that effective sustainability transitions will close. Similar to the problem definition issue though, a careful discussion needs to be explored balancing the competing interests of transition agents to define a common consensus vision is important. On the one hand, aspirational statements and visions can often be highly motivating and can establish a broad are to strive for (e.g., being a sustainable city). These aspirational visions bust be balanced with concrete action steps (transition strategies, to be discussed next). Again, like the problem definition, it is valuable to often shift between micro- to macro-scale perspectives about the problem to articulate an appropriate actionable "sweet spot" for the aspirational vision compared to the concrete goals. An example of a desirable sustainability vision for a transportation system could be that all or a high percentage of citizens live within walk sheds of bus and transit stops.

Transition strategies. Once the working definition of a transition (gap between the current state and vision) has been defined, transition agents can develop plausible strategies to guide their transition (Kay et al., 2015). Identifying opportunity spaces helps specify the interventions (Schensul, 2009) within a strategy, and determine what should come first. Effective opportunity spaces will be legal, as well as technically, economically, and politically viable (Nevens et al., 2013). Then, iterative testing (Hekler et al., 2015)(van Buuren & Loorbach, 2009) targeting those opportunity spaces can quickly cycle and evolve to show proof of concept. During and after the pilot period, evaluation of progress (Forrest & Wiek, 2014) can drive agile iteration to keep pace with changing context and opportunities. Eventually, over a modest time horizon, pilot initiatives should track into larger scale interventions that show progress toward the transition's vision, with a particular focus on how small-scale and actionable strategies translate into more distal outcome strategies. Transition strategies for our transportation example might include near-term streets restriping with bike lanes to improve multimodal connectivity and demonstrate cost effective pilot initiatives that support the vision of broad transit accessibility. Over time, smaller projects could build public support for larger investments (bonds, tax increment financing, etc.) in transit expansion or housing and employment development near existing transit.

Transition arena meetings. In order for transition agents to interact, they need to communicate. In the ideal case, they meet in person in a city's UTL (Nevens et al., 2013). Without a UTL, individual transition arenas will meet separately. The timing of meeting repetition will be contextual to a transition and its agents, but should be consistent enough to maintain momentum and progress

toward the transition's vision. Meeting repetition might be contingent on singular events like bond initiatives, yearly events like fiscal year end dates, or more regular events such as neighborhood association or city council meetings. Transition arena meetings may be more appropriate before events (for preparation) or after (for reaction and planning in a potentially new environment). If transition agent attendance wanes, it's possible that meetings are happening too often, which can ask more time than agents have to give or create meetings with insufficient content for real productivity.

The temporal expectations for such meetings should be that repetition is open-ended (Loorbach et al., 2011), because transitions related to sustainability appear to take place over generations, and it's not always clear when transition goals will be achieved. Additionally, the oft cited ongoing monitoring, iteration, and maintenance needs (Loorbach, 2007; Rotmans & Loorbach, 2009; Jhagroe & Loorbach 2014) will not always be clear up front.

Transition arenas can meet either virtually or in-person and either synchronously or asynchronously. Synchronous, in-person meetings can build trust and capitalize on down time when transition agents interact about parallel processes or other transitions that overlap with the arena that is meeting. More research is needed on the relative benefits of analog versus digital collaboration, but digital spaces show promise (Hu et al., 2012). The most effective digital collaboration will rely on meeting space designed to support it. For example, space hosting digital collaboration should be collaboratively laid out and outfitted with the tools necessary to support decision-making (internet, projection, audio, etc.). Personnel who understand their use and maintenance should support any tools in use, but

transition agents should not be afraid to experiment and build their capacity with new methods and equipment. Soft- and hard-ware for participatory modeling (Johnston, 2015) or structured public engagement (Bailey et al, 2011) might be of great use to a transition arena, but also initially unknown to the transition agents.

Whether virtual or analog, transition arena meetings will likely be convened by an individual representing an institution. The convening institution is a crucial factor in attracting agents meeting the transition agent selection criteria. The institutional setting for a transition arena must not alienate relevant stakeholders or wield undue power in interactions; it should be unbiased (Rowe & Frewer, 2000). To the degree possible, the convening institution should support democratic interaction within the arena, facilitating expression of all voices at the table.

Summary. In sum, successful urban sustainability transition arena settings will clarify the transition purpose and boundaries. They will operate based on transparent rules developed through interactive process design. These transition arena settings will create or use co-generated transdisciplinary problem definitions and structures, an assessment of those problems in the current state, and a vision for a sustainable and desirable future. They will identify clearly defined opportunity space for intervention, and iterate an agile, phased strategy of interventions that transition from the current state toward the desired sustainability vision. Transition arena meetings should take place regularly, in-person (to the degree possible), within an institutional structure that supports (rather than inhibits) democratic transition agent interactions, and in a space appropriate for the type of interactions necessary to support an urban sustainability transition.

Criteria for Urban Sustainability Transition Decision-Making Facilitation Tools (How)

Transition arenas host the decision-making that creates the desired transformation. When designing tools to support decision making, it is essential to acknowledge that people are susceptible to heuristics and biases (Tversky & Kahneman, 1974), path dependency (David, 1985), and power asymmetries. Given these tendencies, decision-making facilitation tools have the potential to improve the decisions made in transition arenas. Rowe & Frewer (2000; 2004) list evaluation criteria for public participation, and the following adapts and expands their criteria so that they can be appropriately applied to facilitation of decision-making in transition arenas.

Definition of outcome success. At the transition level, success is defined as achievement of the transition purpose. Of course the major decisions within a transition arena will be the strategies and interventions, which again exhibit the multi-scale conceptual challenge (Nevens et al., 2013). However, whether within a UTL, transition arena, or intervention, the product of an effective, individual decision will vary with scale and context. For example, the success of transition marketing and branding efforts might be defined by the level or diversity of participation. Defining the success of a specific decision is the responsibility of the transition agents, and should be well understood before beginning a decision making process. Before deciding on a marketing strategy for a transition, for example, transition agents should define the successful elements of a marketing strategy, e.g. a timeline, specific products (flyers, billboards, etc.), task responsibilities. Defining success within a decision environment focuses decision makers on the requisite

decision elements, offers clear criteria for the structure of decision product(s), and facilitates retrospective evaluation of success (Rowe & Frewer, 2004).

Process satisfaction. Process satisfaction can be correlated with outcome satisfaction (Bailey et al., 2011). Process satisfaction is contingent on many factors, and like other aspects of urban sustainability transitions, process satisfaction can cross scalar boundaries. The following criteria, adapted from Rowe and Frewer (2000; 2004), operationalize process satisfaction so that it can be evaluated for specific decisions.

Task specificity and structured decision-making. Transition agents should understand the task at hand. They should know what decision is being made, and identify what tasks must be carried out to make the decision (Rowe & Frewer, 2000). Agents might take on a variety of separate tasks to make a decision, or might break up into subcommittees. The more structured a decision can be, with tasks and responsibilities, the more focused individual transition agents can be on their piece of the puzzle. That said, there is also often a counter-desire to build understanding and empathy between transition agents. For building empathy, it is often valuable to help aid different stakeholders in better understanding the perspective of the other transition agents to help deepen understanding on the most appropriate decisions. Tasks will range, sometimes discussion will be primary, and other times the agents might research data, make site visits, or create materials for the transition arena to review.

Availability of relevant information and materials. In order to make evidence-based decisions, decision makers need relevant information and materials (Rowe & Frewer, 2000). For urban sustainability transitions, this will often include

maps, public perceptions, income data, and population projections, etc. This criterion is important to apply throughout decision-making processes, as needs for new or adapted information and materials will arise throughout the process. Ideally, availability of relevant information and materials is assessed whenever a decision is made, to determine whether the transition agents had what they perceived they needed to make the best decision. Of course, there will be instances where relevant information or materials do not exist. For example, data might be available at the census block instead of postal code geography.

Availability of relevant expertise. Similarly, expert knowledge is required to make evidence-based decisions. This knowledge might already be seeded in the transition arena, but sometimes experts from outside the arena will be needed to support decision-making. Relevant expertise is an extremely important venue for negotiation. Rather than seeking consensus among experts, it's often important for transition agents to absorb and negotiate the perspectives of various actors (Stirling, 2010). For example, developers, city government, and neighbors might all bring different expertise to the development of a specific parcel. Only taken together can these pluralistic expertises reveal the appropriate opportunity space for strategic intervention.

Accessibility of abstract concepts. Many urban sustainability concepts are somewhat abstract (e.g., urban heat island, walkability, and housing affordability). Further, large numbers are often difficult to comprehend and transition agents might struggle to understand, for example, the specific implications of 100,000 new citizens in 20 years or the effects of a $50 million investment in a neighborhood. Strong facilitation of decision environments

(Johnston & Hansen, 2011, e.g. "provide open access to useful tools data and tools in *usable formats*" p. 206) can express abstract concepts in a way that is salient for transition agents, for example, communicating the relative costs of infrastructure investments with proportionally sized cards.

Facilitation of articulation of rationale for decision-making. Participants in any process want to feel heard, with opportunities to express themselves and explain their positions. This could happen in a forum for sharing information, perceptions and concerns that encourages each participant to express their views and to explore alternative avenues of response (Few et al., 2007). The most effective transition arena decision-making environments will therefore facilitate transition agent articulation of rationale for their perspectives. The opportunity to express rationale improves process satisfaction because agents not only feel heard, but might also feel understood if other agents support or agree with their rationale. This criterion is time sensitive because there is only so much airtime for agents to express their rationale. In large group meetings, only a minority of participants might speak, leaving other participants unable to contribute. One solution for large groups is using subcommittees to facilitate articulation of rationale. Of course, this increases the burden of facilitation, as well as synthesis of activities across subcommittees. This can often be at least partially mitigated by thinking clearly through the balancing of perspectives of key transition agents to ensure the sub-committees have appropriate champions for bringing back the discussions from their group and relaying them back to their other agents.

Summary. In sum, successful urban sustainability transition arena decision-making facilitation will define outcome success and design for process

satisfaction. Transition agents should understand and feel confident in their ability to complete specifically designated tasks. For those tasks, relevant information, materials, and expertise should be available and accessible. Abstract concepts related to the decision(s) at hand should be communicated and operationalized to make them as salient as possible for the transition agents. Actual facilitation should give all transition agents the opportunity to share their perspectives, as well as explain the rationale behind those perspectives. Overall, this establishes some ideas on proximal outcomes for success that can be gleaned for decision support tools, thus supporting more critical evaluation of specific transition arena decision point processes.

Measurement Instruments

An initial stakeholder engagement process should help determine which citizens meet the criteria for becoming transition agents in a particular transition arena. Within such a stakeholder engagement process, interviews, focus groups, and events offer data collection opportunities for assessing potential transition agents against the "Who" criteria. Observation of early transition arena meetings, and document analysis, can show whether the transition arena setting includes the clear purpose, boundaries, rules, and inputs from the "What" criteria.

For the "How" criteria, a definition of success is only useful if it is possible to evaluate if/when success is achieved. This means that success must be operationalized in measurable ways. On the process side, surveys are a common instrument for measuring process satisfaction (Germain et al., 2001; Nabatchi, 2012). Surveys can be used to measure overall process satisfaction, but may also be appropriate for the above criteria. For accessibility of abstract concepts and

facilitation of articulation of rationale, grounded theory analysis of recorded interactions can also offer insight into which abstractions became most salient, which did not, and how often the decision environment offered agents the chance to express their rationale for decisions. A central part of this process is to also focus on the likely types of processes being desired for any given interaction between transition agents. For example, in one context, a logical desired process outcome could be to explore instances of transition agents engaging in perspective taking of others transition agents. There are often both qualitative and quantitative attributes that can be measured and examined for examining the quality and thus success of any given transition interaction.

Evaluative Criteria for Decision-Making in Urban Sustainability Transition Arenas

The criteria in this chapter have been collected as a method for defining proximal outcomes that can be used to assess whether decisions made in transition arenas meet the expectations of the literature. The vantage point for the assessment is an individual decision, about which, the following questions can be asked:

Table 3

Questions for Evaluating Urban Sustainability Transition Arena Decision-Making

Question	References
Does the transition arena making the decision include the right transition agents?	
Do they represent the diversity of interests and affected populations?	Rowe & Frewer, 2004; van de Kerkhof & Wieczorek, 2005
Do they have sufficient collaborative capacity?	Foster-Fishman et al., 2001; Johnston et al., 2010
Do they have the knowledge and skills necessary to complete their transition?	Brundiers et al., 2013; Jhagroe & Loorbach, 2014
Do they have enough influence to realize their transition?	Rowe & Frewer, 2000
Does the transition arena provide the right setting for decision-making?	
Is the purpose of the transition clear?	Frantzeskaki et al., 2014
Are the boundaries of the transition clear?	Bos et al., 2014
Are the rules for transition agent interactions clear and based on interactive process design?	Edelenbos & Klijn, 2005; Avelino, 2009
Are the transition's sustainability problems defined and assessed?	Wiek & Lang, 2014
Does the transition's vision for a desirable and sustainable future meet the literature's criteria?	Loorbach, 2010; Wiek & Iwaniec, 2013
Do the transition's strategies identify opportunity spaces, pilot projects, and interventions, with progress evaluation that drives iteration?	van Buuren & Loorbach, 2009; Kay et al., 2015
Does the facilitation of the decision environment provide the right foundation for evidence-based decision-making?	
Does the decision have a definition of outcome success?	Rowe & Frewer, 2004
Do the transition agents making the decision understand the task at hand and the structure of what they will produce?	Bailey et al., 2011
Are all relevant information, materials, and expertise available to the transition agents making the decision?	Rowe & Frewer, 2000
Are relevant abstract concepts rendered as salient as possible for the transition agents making the decision?	Johnston & Hansen, 2011
Do all transition agents have the opportunity to express their opinions and offer rationale for those opinions?	Few et al., 2007

Evaluation criteria can double as design criteria. Once evaluation of successful decision-making for urban sustainability transition arenas is clear, process design can take its cues from those evaluative criteria. A burgeoning

transition arena could thereby use the preceding criteria to design its decision environments.

Discussion & Conclusions

Transition arenas are a critical area of research that need further study to determine their effectiveness in urban settings. The multi-scale challenge (Nevens et al., 2013) presents a variety of challenges for evaluating that effectiveness, because complex things happen across many scales and timelines. Ideally, evaluative criteria could be applied and used to innovate at each discrete step in a transition. However, transitions are messier than linear steps, time can be in short supply, and evaluative criteria are not always articulated.

This chapter aims to fill the gap in evaluative criteria for one place in the multi-scale challenge: specific decision points within urban sustainability transitions. These criteria use that lens to evaluate transition agent participation, transition arena setting, and decision facilitation tools. As more transitions progress and come to fruition, evaluation of key decisions using these criteria can lend insight to future efforts. Evaluating specific decisions using the entire context of the transition arena model can help researchers and practitioners understand the dynamics of urban sustainability decision environments, and design the best possible versions of future environments. As anticipatory tools, this chapter's criteria can become a checklist for the design of urban sustainability transition decision environments.

Future research in this line would benefit from testing the feasibility of operationalizing these criteria both before and after decisions. What can we learn about past decisions through applying these criteria? Which future decisions would

benefit most from application of these design criteria? Where else can specific criteria hone the activities of transitions to address the multi-scale challenge? Urban sustainability transitions face these, and many other open questions. To move the focus of scholarship in this field from analysis to action, we must evaluate rather than analyze, and use that evaluation for agile innovation throughout the complexity of urban sustainability transitions.

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Chapter 4

Evaluating the Citizens Committee on the Future of Phoenix Transportation's Prioritization Workshop as a Decision in an Urban Sustainability Transition Arena

In the transition research literature, "transitions" are long-term, large-scale change in societies or their subsystems (Rotmans et al., 2000), which require management:

> a deliberate attempt to bring about structural change in a stepwise manner. It does not attempt to achieve a particular transition goal at all cost but tries to utilise existing dynamics and orient these dynamics to transition goals that are chosen by society" (Rotmans & Kemp, 2003, p.15)

Transition management can take place in transition arenas: "the actual initial incubators of change; they are crewed by local frontrunners that are considered as engaged visionary people with diverse backgrounds" (Nevens et al., 2013, p. 111). For the purposes of this article, we term those frontrunners participating in transition arenas "transition agents" based on previous work (Harlow et al., 2015).

Though transition arenas arose supporting change at the regional scale (Kemp & Loorbach, 2003), they have more recently been utilized at the city/urban scale (Nevens & Roorda, 2014). Urban sustainability transitions are complex and can happen simultaneously at a variety of scales, presenting a "multi-scale conceptual challenge" (Nevens et al., 2013, p.113). Harlow et al. (2015) address this conceptual challenge at the scale of specific decisions within urban sustainability transition arenas, and offer proximal outcome criteria for evaluating and/or designing decision environments for such arenas. This article operationalizes those criteria for a specific decision– a new transportation plan– in an urban sustainability transition arena– the Citizens Committee on the Future of Phoenix

Transportation (CCFPT)– in Phoenix, AZ. This study empirically examines this specific decision, with a focus on documenting the background that set the stage for this decision point, the human-centered design strategies used to advance to the decision point agenda, and a largely descriptive qualitative and quantitative evaluation of the overall process. We conclude with plausible working hypotheses on "lessons learned" that can then be evaluated in future transition arenas.

Conceptual Model for Evaluating a Transition Arena

In the preceding chapter, multidimensional suggestions, phrased in the form of answering a series of questions, were established for evaluating the quality of a transition arena. Briefly, evaluating a transition arena ultimately involves evaluating if the right transition agents are present, if an appropriate setting is established for supporting the transition agents, and if the facilitation of the transition agents supports an evidence-based decision-making process (see Table 3 for more details). We will utilize this conceptual model to evaluate the CCFPT's transportation plan decision.

Background of the Citizens Committee on the Future of Phoenix Transportation

In 1985, Maricopa County voters approved a 0.5% sales tax that created a Regional Public Transportation Authority, with funding for freeway and transit expansion. In 2000, City of Phoenix voters passed the Transit 2000 Regional Transportation Plan with a 0.4% citywide sales tax to supplement funding for bus, light rail, and other transit (Valley Metro, 2015). With its Transit 2000 Regional Transportation Plan, Phoenix began a large scale, generational sustainability transition for its transportation infrastructure.

In 2008, using funding from both the city and county measures, the City of Phoenix opened a regional light rail line (Golub et al., 2012). Phoenix's citywide sales tax was scheduled to sunset in 2020, which would have reduced the new light rail, existing bus, and other transit services by up to 60% (MAG, 2015). In order to avoid extreme service disruption, in 2014, Mayor Greg Stanton and Phoenix's City Council established the CCFPT. The CCFPT's 35 members were appointed by the mayor, each City Council member, and selected from Phoenix's Citizens Transit Commission (City of Phoenix, 2015).

Committee meetings began in August of 2014, with a charter stating the goal of:

> Develop a transportation plan, based on current and projected community needs that identifies:
> - Transit improvements
> - Street improvements that support transit development
> - Funding strategy(s) to implement a comprehensive transportation plan
> - Provide a comprehensive transportation plan and funding strategy(s) by the end of the year (City of Phoenix, 2014b, p. 11)

In order to help identify "community needs," Phoenix's Public Transit Department launched a community engagement effort in the summer of 2014. This included the online portal TalkTransportation.org as well as presentations and visits to many neighborhood, business, and government organizations throughout the city (City of Phoenix, 2014c). To assist with that public outreach, Public Transit Department staff reached out to the School of Public Affairs Center for Policy Informatics (City of Phoenix, 2014a) and the Center of Urban Innovation (Hernandez, 2015) at Arizona State University (ASU).

In August of 2014, researchers from the Center for Policy Informatics, the Designing Health Lab at Arizona State University within the School of Nutrition and Health Promotion, and the School of Sustainability met with the Public Transit Department to discuss collaboration for the public engagement efforts. After a series of meetings and discussions, the ASU team agreed to 1) assist with online public engagement through talktransportation.org, 2) orient two graduate classes toward the development of the transportation plan, and 3) to provide research support to Public Transit staff tasked with responding to queries from CCFPT members. The specific goals of the research team were to help articulate Phoenix citizens in the CCFPT process, understand CCFPT member preferences, and identify opportunity spaces in the process where intervention could support CCFPT decision-making, whether through provision of information, expertise, or facilitation.

As will be discussed in the results section, an important transition arena decision point emerged during this iterative developmental process. Specifically, a workshop was requested by the CCFPT members to support prioritization of the potential transportation plan elements presented to them by City of Phoenix staff. At that time, Public Transit Department staff welcomed the help of the ASU team already working with the committee to devise decision support tools for the workshop. Taking design guidelines for the workshop from Harlow et al. (2015), the ASU team aimed to produce a workshop that 1) satisfied participants, 2) facilitated empathy with the public and across competing stakeholder interests, 3) had access to relevant data and staff expertise to facilitate an evidence-based decision among the CCFPT, and 4) offered all participants opportunities to contribute their opinions and explain their rationales.

Methods

Human-centered design process. The participants in this research were City of Phoenix staff in the Public Transit and Streets Departments, the 35 members of the CCFPT, and Phoenix citizens. The research was designed with a human-centered design approach (Maguire, 2001). As articulated by Maguire, human-centered design involves a suite of both qualitative and quantitative methods for designing tools and resources for a particular artifact (often software but it can be used for a wide range of domains outside of software such as the decision support tool ultimately created for the CCFPT). Human-centered design often includes the following general principles: 1) active involvement of those individuals, in this case transition agents, that will ultimately use the final tools to be developed; 2) a careful allocation of function that balances the tasks driven by the individuals/transition agents compared to those driven by the tool itself (e.g., in this case, balancing knowledge of individuals with an appropriate design to enable effective emotional understanding of the decisions being made); and 3) the use of an iterative design process, with prototypes generated to help better articulate and define solutions; and a multidisciplinary design team.

Utilizing these principles, there are a wide range of design methods and strategies that can be used (e.g. brainstorming, parallel design, paper prototyping). Within this study, we primarily used these methods: (a) personal interviews with Phoenix citizens, particularly disadvantaged individuals that may have limited political articulation, and members of the CCFPT themselves; (b) surveys of Phoenix citizens and the CCFPT to gather additional information about their desired features for the Phoenix transportation plan; (c) sketching/paper prototyping of tools

to support interactions, both between research personnel and Phoenix citizens, and between the CCFPT members themselves; and (d) physical prototyping of early versions of the final decision support tool for the CCFPT and iteratively improving upon the design. ASU faculty (co-authors) and graduate students in the classes interacted closely with members of the Public Transit Department during all of these methods and processes.

Decision support tool evaluation. As articulated earlier, the CCFPT requested a workshop to support prioritization of transportation options and budgeting. During this prioritization workshop, Public Transit Department staff recorded audio for 4 of the 5 teams, with lengths of approximately, 1.5, 2, 2, and 2.75 hours (note, these audio recordings are publically available in the form of condensed meeting minutes). This audio was rerecorded to a device with a digital output and stored for analysis. The ASU team reviewed the audio recordings using a grounded theory approach (Charmaz, 2006) to derive a list of potential coding elements relevant to Harlow et al.'s (2015) evaluative framework. Three coders were then recruited to listen to and code the audio recordings.

The first step in the coding process was orientation. The first author explained the project and the goals of this article to the three coders. They then reviewed the materials available to the CCFPT members present for the workshop, including the activity introduction script (Appendix B), the facilitation guide (Appendix C), the investment table (Appendix D), a map of potential transportation solutions and projected development density (Appendix E), and a supplementary materials packet. Then, the coders explored the codes (Appendix F) they were to use:

1) process satisfaction, 2) empathy with the public (or each other), 3) use of staff expertise, 4) use of available data, and 5) rationale for decisions.

The team went through an iterative process for establishing veracity of the coding. This included multiple rounds, initially, of clearly defining and re-defining the codes with a sub-set of the audio recordings. This was done to establish conceptual agreement among all coders on the codes developed. After this, all audio recordings were double, and at times triple coded by separate coders. After all audio filers were at least double-coded, the coding team met to discuss discrepancies. The team met and discussed all discrepancies until a final, mutually agreed-upon code was established for all recordings.

The final definitions for the four codes that were used are as follows:

1. Empathy was coded when CCFPT members expressed empathy with the public, for example: "People who ride the bus need to get to work."
2. Rationale was coded when CCFPT members offered a rationale for the inclusion or removal of a plan element, for example: "That costs too much, we should take it out."
3. Data was coded when the data available to CCFPT members was leveraged to make decisions, for example: "The map shows high population growth there."
4. Staff was coded when the attending city staff answered questions beyond the data available to CCFPT members, for example: "What federal fund would potentially be available to pursue this transit expansion?"

Descriptive statistics (e.g., means, standard deviations, percentages) from this coding work as well as process satisfaction surveys administered by the Public Transit Department are reported below.

Results

Preparatory work done to establish an effective transition arena.

While the primary focus of this paper will be on examining the quality of this specific workshop to support an evidence-based decision about the future of Phoenix transportation, it is essential to acknowledge all of the preparatory work that set the stage for the workshop. We will use our previously articulated criteria for a transition arena to frame this conversation by explicitly answering Harlow et al.'s (2015) series of questions.

Do the transition agents represent the diversity of interests and affected populations? The 35 members of the CCFPT were selected by all nine Phoenix City Council members, and represented the Greater Phoenix Black Chamber of Commerce, Amalgamated Transit Union Local 1433, Bicycle and Pedestrian Task Force, Arizona Forward (non-profit), Phoenix Association of Realtors, Phoenix Suns, Friends of Transit, the Reason Foundation, Neighborhood Ministries, Central Arizona Shelter Services, and the Citizens Transit Commission, among others. This large committee was drawn from a wide variety of Phoenix organizations and constituencies as an attempt to represent the diversity of interests and affected populations, ranging from large businesses, to mission-driven transit organizations, a libertarian think tank, and service providers for the homeless.

Do the transition agents have the knowledge necessary to complete their transition? The transition agents assembled in the CCFPT brought significant knowledge to the process from their personal and professional experience, including capacity in economics, labor union organization, real estate development, transportation advocacy, and long-term residency in Phoenix, among many other knowledge domains. The committee meetings augmented the CCFPT members' existing knowledge base with presentations of data and projections specific to transportation in Phoenix. This included ridership details, geography of current and potential light rail and bus lines, budget projections for the Public Transit and Streets Departments, potential cost estimates, potential funding sources and levels, and shortfalls in promises under Transit 2000 (Public Transit Department, 2000; Public Transit Department, 2014; Streets Department, 2014).

In addition to technical information, city staff presented data from their public engagement process at each meeting prior to, during, and after the workshop. These presentations included comments from the public, numbers engaged online and at events, as well as emergent themes from the engagement. The CCFPT process lasted approximately 5 months (8/26/14—2/2/2015), engaging over 3,000 people at more than 60 events (City of Phoenix, 2014c).

During the prioritization workshop the participants were provided a packet summarizing the CCFPT meetings, including the public engagement data, which was augmented by student efforts (more on this below, Appendix G). There were maps (Appendix E) at each table showing projected employment and population density around proposed transit expansions, as well as the investment table (Appendix D) with cost projections and justifications for each line item. These

resources were supplemented with the presence and contributions of key transportation staff, including the Deputy City Manager, the Director of Planning and Development for Valley Metro Rail (the regional transportation authority), and the Public Transit Department staff responsible for generating the cost projections.

Do they have the skills necessary to complete their transition? In this case, completing the transition would be passage of a citywide ballot initiative funding a transportation plan resembling the plan produced in the CCFPT prioritization workshop. This would be the logical next step in the generational transition, because it would secure city funding for long-term transportation investment. To facilitate passage of the ballot initiative, members of the CCFPT have been subsequently absorbed into MovePHX (MovePHX, 2015), a non-profit collaboration between the Mayor's office, the CCFPT members, a political consultancy specializing in ballot initiatives, and others. Phoenix Moves is tasked with marketing Phoenix's new transportation plan to the voters who will be able to decide on its success in August of 2015.

Do they have enough influence to realize their transition? Each CCFPT member was appointed by the mayor, a city council member, or served on the Citizens Transit Commission, giving them a specific point of influence within city government. The diversity of the members ensured that the committee's work would be known to many interest groups beyond city government. Further, the expertise of committee members in economics, real estate development, city and national politics, as well as transportation development provides potential pathways for influence in relevant industries.

Does the transition arena provide the right setting for decision-making?

Is the purpose of the transition clear? The CCFPT charter detailed the purpose of the transition, namely to create a new transportation plan for Phoenix with a funding scheme to support that plan. During the meetings, the breadth of that purpose was debated, primarily to establish the extent to which the plan would fund street improvements. Committee members discussed whether street investments would be specific to transit (e.g. bus pullouts or BRT specific lanes) or should make up a larger proportion of the plan. The upshot was a streets subcommittee that apportioned ~$5 billion of the final plan to street improvements not restricted to transit-related uses. Overall, given that these issues had been mediated before the workshop in question, the transition purpose was clear on the day of the event.

Are the boundaries of the transition clear? The transition boundaries were the city limits of Phoenix. In particular, discussions about a light rail extension to University of Phoenix Stadium in Glendale resulted in terminating the line at the city boundary for the purposes of this plan. The Maricopa Association of Governments and the City of Glendale are expected to plan and fund the continuation of that light rail line to the stadium from their boundary with Phoenix. Similarly, though the light rail reaches Tempe and Mesa, and many bus lines cross municipal boundaries, all discussions for this plan remained within the boundaries of Phoenix, though they specifically referred to the need for regional coordination for transit that crossed city lines.

Are the rules for transition agent interactions clear and based on interactive process design? The rules for transition agent interactions at the workshop were communicated in preceding committee meetings as well as during the activity introduction at the workshop. The introduction took place in two parts, beginning with a general announcement of the day's plan and schedule, followed by detailed activity introductions by each table's facilitator, lasting about half an hour. Committee members at each table had the opportunity to ask clarifying questions, specify the goals and products of their work within the context of creating a plan from the elements provided, and mold the process to their style. One table removed all the pieces to start the exercise, some tables recommended high-capacity transit (HCT) investments be bus rapid transit (BRT), rather light rail (at which those pieces had been costed), and the discussions among tables varied as to which elements received the longest consideration.

Are the transition's sustainability problems defined and assessed? In this case, the sustainability transition is in the transportation sector. The CCFPT meetings often consisted of Public Transit and Street Department staff articulating defined and assessed transportation sustainability problems. Some common and crucial examples were: funding shortfalls under Transit 2000 due to the 2008 economic crisis, future transportation service reduction without a new funding mechanism, insufficient floodwater management capacity, overdue street maintenance cycles, lack of multi-modal connectivity due to service hours or geographic coverage, etc.

Does the transition's vision for a desirable and sustainable future meet the literature's criteria? In this case, the CCFPT was tasked with creating a vision for the transportation system in the form of a new funded transportation plan for Phoenix. To meet this criterion, the structure of the plan should conform to Wiek & Iwaniec's vision criteria (2014).

Table 4

Correspondence of Phoenix's Draft Transportation Plan to Visioning Criteria

Criterion	Correspondence
Visionary	Plan is a far-sighted, holistic, desirable future state, but lacks surprise and utopianism.
Sustainable	Plan features radically transformed infrastructure in compliance with sustainability principles.
Systemic	Plan includes systemic linkages among transportation modes and recognizes the need for coordination between bordering municipalities.
Coherent	The goals of the plan are internally reconcilable.
Plausible	There are many empirical examples of similar transit development in other U.S. cities.
Tangible	The goals of the plan are clear and detailed, but could include more detail at smaller scales.
Relevant	The overarching plan goals are clear and focus people on the near-term task of passing the plan on the ballot.
Nuanced	Because of its scale, the plan could improve its nuance within elements.
Motivational	The plan envisions a Phoenix with transit connecting major residential and employment areas, as well as regional access, which should motivate many citizens to support the ballot initiative.
Shared	The plan produced in the workshop (with minor modifications) was approved by the CCFPT, the Transit subcommittee of Phoenix's City Council, as well as City Council itself.

Do the transition's strategies identify opportunity spaces, pilot projects, and interventions, with progress evaluation that drives iteration? The transportation plan identified opportunity spaces along highly trafficked corridors and where future job and employment density. The most

promising of these opportunity spaces are included in the plan with specific transit projects, ranging from circulators, to streetcars, buses, BRT, and new light rail lines. Progress evaluation is not specified at this point, and is an area where improvements could be made from the results under Transit 2000.

Human-centered design research process.

Public engagement. While the prioritization workshop is the primary focus for this paper, there was a complementary human-centered design process that informed the CCFPT workshop and thus will be discussed briefly here, particularly the results of this work that informed the workshop. Initially, a transportation survey used in Boulder, CO (Inspire Boulder, 2014) provided initial inspiration for budget allocation exercises. Through a series of iterations on the idea, the final version of this budgeting exercise manifested as playing cards representing a diversity of transportation priorities (Appendix H). Each card visualized a transportation priority and assigned it a number. Participants were asked to choose options totaling up to 30, in order to establish which transportation ideas were most important to the public. The collective work of this poker deck prioritization exercise, as well as direct quotes gleaned from Phoenicians while interviewing them with the card sort were summarized as posters that were displayed at the workshop. The content primarily consisted of pictures of residents, with quotations from those residents about transportation in Phoenix, with one poster offering anecdotal survey results from the playing card tool (Appendix G).

Workshop iterative design results. CCFPT meetings, which were open to the public, primarily consisted of City of Phoenix staff presenting transportation data to the committee and facilitating dialogue about the outcomes. Presentations

detailed issues such as the elements of the Transit 2000 Regional Transportation Plan that had (and had not) been achieved, the transportation needs based on public outreach, and the projected transportation needs for the future (Public Transit Department, 2014; Streets Department, 2014). As the CCFPT meetings remained focused on educating the committee, some committee members became anxious about their progress toward creation of a transportation plan. To accelerate their work, one CCFPT member requested a supplementary weekend workshop (which would also be open to the public) in order to prioritize the transportation options presented by city staff. These prioritized options would then become a draft of the transportation plan central to the charter.

At this point, the ASU research team offered to assist with design and preparation of the prioritization workshop, based on experience with participatory workshops under a prior planning project, called Reinvent Phoenix (Wiek et al., 2014). Given that the prioritization workshop was an unexpected element of the CCFPT process, Public Transit Department staff welcomed the assistance. Because of anecdotal process satisfaction reported by respondents to the playing card-based public survey (discussed above), the ASU team decided to build on that product for the prioritization workshop. To present the idea to Public Transit staff, the ASU team shared the playing card survey tool, and created a simple physical prototype to re-design the basic process to be more appropriate to the CCFPT members.

For this iteration, the budgeting concept moved from a playing card format to sizing square "pieces" based on the projected cost of each transportation option; and, instead of adding to the arbitrary total of 30, the new square pieces would be placed on a surface area, or "board," which would rely on the same proportions as the pieces

to represent the total cost of the transportation plan. The ASU team outlined general "rules" to the Public Transit staff, which consisted of having the CCFPT members discuss each piece in turn to decide if each piece would be included, excluded, or altered (e.g., allocating more or less funding than the default option piece). In this way, the participants could have a simple physical object to help them prioritize options. As this was also a budgetary decision, the size of the board was also used to help communicate the running plan costs during the activity. The thought was that as a plan changed, new boards (e.g., smaller for less expensive plans, larger for more expensive plans) could be used to facilitate budgeting. The reasoning behind these choices was that 1) the proportionality of the pieces and boards made abstract costs of large investments salient for participants, 2) the proportionality of the pieces and boards made relative costs of investments accessible for participants, 3) the tactile nature of examining, replacing, and/or removing pieces from the boards facilitated discussion among participants around specific decision points for which they could offer their rationale, and 4) beginning with the pieces on the board reinforced the priorities identified by Public Transit and Streets Department staff, if all transit options were funded.

This first paper prototype was simply a sheet of 8.5" by 11" paper, cut into differing sizes, with titles of transportation options and made up costs, e.g. new light rail lines were large pieces, whereas installing shade at all bus stops was a small piece. The pieces were then placed on another 8.5" x 11" piece of paper that represented a total cost for the plan. Maria Hyatt, the Director of Phoenix's Public Transit Department, found the concept interesting, and suggested presenting the idea to the committee at the next meeting.

To prepare for the first presentation of the idea to the CCFPT, the ASU team created a second prototype. This iteration used some of the artwork from the playing card tool, as well as cost projections from Public Transit Department staff. Cards were color coded to differentiate between categories, i.e. bus, light rail, streets, etc. The research team printed a subset of the pieces at a large size in order to present the concept to the CCFPT.

During the CCFPT presentation, committee members were not entirely certain that the proposed activity would produce the product they had in mind, i.e. a transportation plan. Because the "board game" (as the CCFPT termed it) was so unfamiliar to their experience, they were unable to visualize how it might deliver a product with which they were familiar, a transportation plan. However, the meeting resulted in the CCFPT approving the general process for the prioritization workshop.

At this point, prototyping became accelerated and intense because only 23 days remained before the workshop's scheduled date. The ASU team began to meet regularly with Public Transit staff to coordinate production of all the necessary materials. First, Public Transit staff translated all potential transportation investments into a table that included titles, explanations, and projected costs (Appendix D). The titles would go on the front of each piece, along with the cost and a visual, and the explanation of each investment would go on the back of each piece to remind CCFPT members why staff had presented each investment.

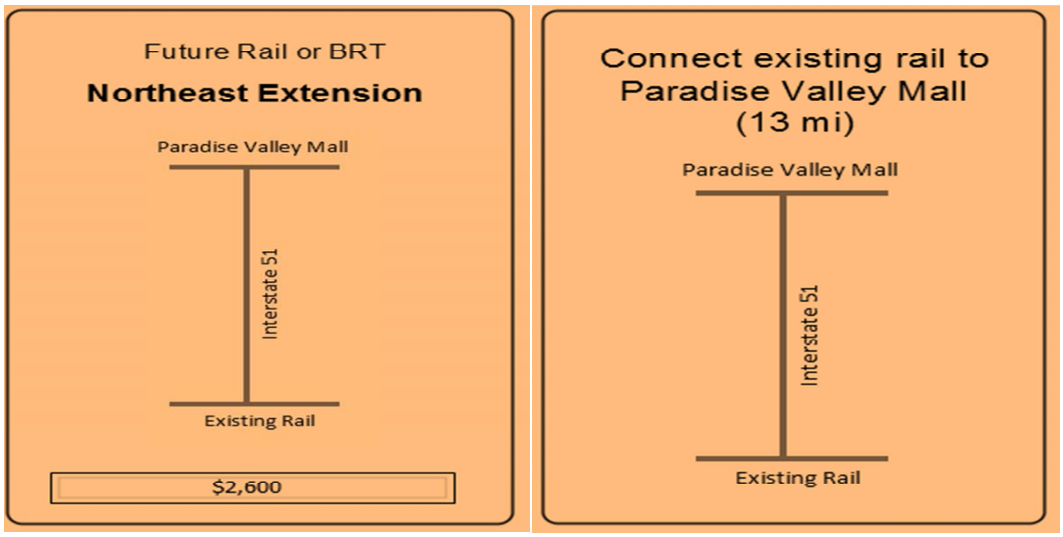

Figure 2. Example of the front and back of an activity piece.

Each line item was discussed to make sure that it would be easily understood by the CCFPT. In addition, the discussions reduced choices to only the most logical options in order to limit the cognitive complexity of the decision-making process and avoid "choice paralysis" (Schwartz, 2004). The tool still enabled careful deliberation without constraining a complex set of decisions to simple yes/no choices. For example, light rail service hours were offered to participants at either existing levels, 24 hours a day, or matching bus service hours; a downtown streetcar option was provided as either in or out of the plan though as the street car was a less central element compared to light rail. While Public Transit staff produced the table of investment possibilities, the ASU team worked with the student who had originally produced the playing cards to create visuals for each potential investment.

The ASU team led a 2-hour training session for the city staff facilitators to prepare them for the workshop and to support the development and evaluation of a third prototype. The third prototype for the facilitator training included one full set of pieces and boards upon which to place the pieces. The boards were used to scale

the proportionality, with 24" by 36" (the largest size to easily print) representing the maximum cost (~$40 billion) of the transportation plan if all investments recommended by staff were included. This left each square inch of the board equivalent to ~$23 million. Each potential facilitator received a copy of the investment table (Appendix D), as well as instructions for the activity (Appendix C).

During setup for the facilitator training, the initial idea of having participants replace their boards was immediately changed based on facilitator recommendations. Specifically, an alternative design was used whereby the surface area of the boards was divided with horizontal labels in $5 billion increments (1/8 of the board). Thus, participants could arrange their included pieces and easily get an idea for the running total of their transportation plan.

During the facilitator training, the correspondence between the facilitation guide and the investment table was insufficient for facilitators new to the process. Some of the pieces were improperly sized, and many graphics were missing. Catching those errors was crucial for a professional final product that would maximize the potential for CCFPT member buy-in and enthusiasm for taking part in the activity and thus facilitating an effective dialogue for effective budget prioritization. Shortly after the facilitator training, both participating ASU classes hosted trial runs of the activity, providing more feedback on piece, board, and activity design. All recommendations from the trial runs in classes and the facilitator training informed the fourth and final iteration, which would be used at the workshop on November 22, 2014.

The ASU team reorganized the facilitation guide (Appendix C) and investment table (Appendix D) for maximum correspondence between each step of

the facilitation guide and each line of the investment table. This helped facilitators stay on track and easily reference between the guide and table during the workshop. The ASU team also prepared an introductory script for the activity (Appendix B), in addition to bringing in the opinions of the public that were gathered through the student public engagement research described above (Appendix G). Public Transit Department staff finalized all piece and board text and visuals, proofed the investment table (Appendix D) to make sure all projections were correct, and printed and laminated final copies.

For the workshop, through careful deliberation between the ASU team and the Public Transit Department, a structuring of teams emerged. To give all attending CCFPT members opportunities to articulate their rationale for including or forgoing possible investments, members would be divided into groups of six or less. These smaller groups offered individual CCFPT members more chances to participate verbally than attempting the exercise with the entire group of 35. Public Transit Department staff chose the teams using the criterion that each group should balance anticipated member preferences. This balance facilitated the next step in the development of the transportation plan, integration of the plans produced by the five teams into a single plan. The November 22, 2014 workshop hosted 24 of the 35 CCFPT members broken out into five teams.

Decision support tool evaluation. Table 5 reports on results in terms of the amount of time spent on each of the coded topic areas. Not surprisingly, the vast majority of the time was spent discussion the CCFPT members' rationale for a particular plan priority (Percent of time discussing rational M=68.9%, SD=17.9). The

other three topic areas were discussed at almost equal percentages of time but at a much lower level than discussing rationales for plans.

Table 5

Amount of Time Dedicated to Each Coded Topic During the Workshop

Group	Empathy with the public		Rationale for plan priorities		Use of available data		Use of staff expertise		Total Time
	% of time on topic	time on topic (min)	% of time on topic	time on topic (min)	% of time on topic	time on topic (min)	% of time on topic	time on topic (min)	min
1	9.3%	7.1	62.4%	47.4	32.2%	24.5	22.9%	17.4	76
2	19.4%	16.7	94.9%	81.6	11.4%	9.8	17.8%	15.3	86
3	8.7%	9.4	64.3%	69.4	6.2%	6.7	10.3%	11.1	108
4	15.6%	18.1	54.0%	62.6	20.4%	23.7	10.7%	12.4	116
Average	13.3%	12.825	68.9%	65.25	17.6%	16.175	15.4%	14.05	96.5

Within coding, it was often possible to code for more than one code at a single time. As such, coded minutes across topics (and thus also percentage of time) when added, result in a value higher than the total min of time. Total Time refers to the time between the first coded statement and the last. All four recordings included clarifying preamble while facilitators oriented participants to the activity, and some post mortem about the process.

Beyond the coding data of the interactions between CCFPT members during the workshop, the Public Transit staff also distributed a process satisfaction survey to CCFPT members who participated in the prioritization workshop. Of the 24 attendees, 9 completed the short survey (see Table 6). Results from this survey indicated that, on average, participants were satisfied with the workshop (overall satisfaction, M=4.4, SD=1.1 with 5=very satisfied & 1=very dissatisfied) and the final product (final product satisfaction, M=4.2, SD=1.4). In addition, there was

general satisfaction with the components of the process as well including the activity (activity satisfaction, *M*=4.4*, SD*=1.1), facilitation (facilitation satisfaction, *M*=4.3*, SD*=0.9), staff availability (staff availability satisfaction, *M*=3.9*, SD*=1.2), and opportunities to voice your thoughts (able to voice opinion satisfaction, *M*=4.8*, SD*=0.4). Finally, results indicated that 6 of the 9 participants believed that the workshop changed the opinions that CCFPT members had about transportation.

Table 6

Process Satisfaction Survey Results

		Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Very satisfied
Overall, how satisfied were you with the Saturday, November 22nd prioritization workshop?			1	1		7
Specifically, how satisfied were you with the Saturday November 22nd prioritization workshop:	Activity		1	1		7
	Facilitation			2	2	5
	Availability of data		2		4	3
	Availability of relevant staff				2	6
	Opportunities to voice your thoughts				2	7
	Final Product	1		1	1	6
Do you feel the conversation at the workshop changed anyone's ideas about transportation?		Yes			No	
		6			3	

Quotes from the audio files also help to reinforce results of the coding and the quantitative results about the positive perceptions of the process. Specifically, comments made about the process during the process were generally supportive of the process (e.g., “This would be great for schools…I’ll take it home and use it at home”), though there were also a few less supportive comments but were not often central to the process (e.g., “These are the tiniest pieces ever”). Reinforcing the overall positive perceptions reported within the process satisfaction, comments generally made about the process were positive with statements such as, “I’m very

proud!"; "I think we did good."; and "We should have this signed and you're going to do a picture right… let's write all of our names." These comments indicate not only satisfaction with the process but also suggest pride and satisfaction with the outcome that was created.

Discussion

The prevalence of each audio code has potential implications for decision-making environments. High prevalence of empathy with the public might correlate with outcomes more responsive to both public input to a process and expert perceptions of public need (e.g. improved bus service for commuters vs. high capacity transit expansion that supports economic development). High prevalence of rationale might represent commensurate collaborative capacity, as six of nine survey respondents felt minds were changed during the workshop. Thus, ample opportunities to express and explain one's ideas might lead to absorptive interactions (instead of quid pro quo), where individuals absorb the ideas and values articulated into their preceding perceptions. For the staff and data codes, high prevalence might correspond with high correlation between outcomes and the perceptions of need by whomever generated and curated the data, or the staff offering their expertise.

Based on the prevalence of various interactions that occurred within the workshop, results indicate a large portion of the time was dedicated to rationale. As such, this work provides preliminary evidence of the possibility of the utility of this decision support tool to move a conversation more to absorptive styles of interaction between members of the committee. This is an important finding as this was the central purpose of the decision support tool. That said, it is worth mentioning that

the other styles of interactions also did occur at relatively equal rates, albeit less often than rationale. This might indicate that these other forms of interaction were ultimately used to further support the primary focus on supporting rationale. Future work is required, however, to examine how well this sort of process raised the opinions and voices of those not present in the committee into the discussion. In particular, it is plausible that more time spent on empathic regard for the broader community would be desirable. Future work is required to better articulate and examine what a good balance between these interactions might be for achieving a successful transition arena.

Overall, the Public Transit and Streets Departments, and their work, appropriately set the stage for the prioritization workshop. As articulated above, the workshop met nearly all of the criteria articulated by Harlow et al. (2015) for having the right transition agents in the process, and establishing the appropriate environment, including appropriate scoping of vision and boundary conditions. This work was then further reinforced by the design efforts of the ASU graduate students who conducted complementary outreach to that accomplished by the Public Transit Department, which was then used as part of the workshop. In total, this previous work effectively set the stage for a meaningful transition arena decision point.

Evaluation of the prioritization workshop suggested that the workshop was successful at supporting effective dialogues between the CCFPT members, ultimately resulting in a plan that the vast majority of the committee appeared to support. This was based both on coding of qualitative results as well as quantitative results from a sub-set of the CCFPT members. To further deepen our evaluation, we

return now to our transition arena questions to expand understanding of the process.

While the vast majority of criteria about the transition agents could be established prior to the workshop, one question about the transition agents, namely if they had sufficient collaborative capacity, could only be answered post-hoc and thus will be discussed now. The prioritization workshop groups were chosen by Public Transit Department staff using the criterion of diversity, so that the transportation plans produced by each group would be balanced, and smoothly integrated into a summative final CCFPT product. All five workshop groups completed a plan with consensus support from their group within the three hours allotted for the activity. Given the process satisfaction reported in the survey (Table 6), and that all groups completed a necessarily collaborative activity on schedule, the CCFPT members seemed open-minded enough to collaborate with others. We now turn to the evaluation of the decision environment for supporting the right foundation for evidence-based decision-making.

Did the decision have a definition of outcome success? The workshop had a very specific definition of outcome success: five discrete transportation plans based on the elements recommended by staff from Phoenix's Streets and Public Transit Departments that could be translated into a final unified plan. This final unified plan was created and agreed upon by the CCFPT group at a later meeting.

Did the transition agents making the decision understand the task at hand and the structure of what they would produce? The central activity at the workshop was newly designed and facilitated for its first time. Given

these uncertainties and the lack of experience, special care was given to orienting the CCFPT members to the activity. A two part introduction, beginning with all 24 attendees, then moving to the tables of 4—6 working with their respective facilitators, helped participants understand the activity to be undertaken, as well as the product from that activity. Within 45 minutes of the workshop starting, each audio recording showed that its group had worked with their facilitator to understand the dynamics of the activity, as well as confirmed that their product would be a picture of their pieces on the board, which would represent their group's preferences within the transportation priorities identified by staff.

Was all relevant expertise, information, and materials available to the transition agents making the decision? The transition agents participating in the prioritization workshop operated in an information rich environment. Each participant brought their own professional and personal expertise, as well as having access to the expertise of the city staff facilitating or present for the workshop. Across the groups for which audio was available, staff provided supplemental information approximately one seventh of the time. Additionally, the entirety of the data presented in the CCFPT meetings was collected for each participant, including public engagement data from events and talktransportation.org, which was further augmented with the posters produced by graduate students. Across the groups for which audio was available, the participants specifically enlisted the data available an average of 16 times per hour.

Each table hosted a map representing future employment and residential density in the city, and showing the path for all potential new HCT investments, as well as a copy of the "Transit Book," which provided any desired supplementary

statistics about Phoenix transportation. Participants had the investment table (Appendix D) detailing each potential plan element, its projected cost, and the reasoning behind its inclusion (e.g. 6th highest ridership bus route in the city). The information in the investment table was also translated onto the pieces, which listed the projected cost numerically, and represented it visually by the size of the piece. Each piece's face also included a visual that helped make the investment accessible to participants and easily locatable on each table's map (Appendix E). The back of each piece similarly corresponded to the investment table, listing the rationale for each element's inclusion in the table. Finally, the boards' surface area represented the total cost of the plan, and was divided into $5 billion slices for easy reference to a running total during the activity.

Were relevant abstract concepts rendered as salient as possible for the transition agents making the decision? Many of the concepts discussed in the workshop were somewhat abstract. All the costs were projections over the anticipated 30 years of the tax, and were thereby potentially subject to economic, technological, or demographic change. The specific routes for transit expansion were subject to further study by staff to determine priorities based on evolving demand. Both the costs and routes (excepting one potential BRT investment) were represented as a single costs and route on the map, giving the participants a concrete, rather than abstract, specific decision for each budget line item. For the costs, the proportionality of the pieces served to make relative costs more salient to participants than the absolute costs, whose size necessarily represented the abstraction. Similarly, the public engagement data from events, talktransporation.org, and the student posters helped make that aspect more salient

for the CCFPT members, who could only attend or review a minimum of public engagements.

Did all transition agents have the opportunity to express their opinions and offer rationale for those opinions? Breaking the 35 members (24 present for the workshop) into groups of 4—6 was strategically aimed at creating smaller constellations in which each CCFPT member had sufficient opportunity to express their opinions about each decision, and support those opinions with their respective rationale. Across the groups for which audio was available, the participants specifically gave rationale during the majority of the workshop. Each group reported that every CCFPT member verbally participated in the activity, in contrast to the 35 member meetings, in which it was rare for all attendees to participate verbally.

Summary. In summary, the CCFPT prioritization workshop met nearly all the criteria offered by Harlow et al. (2015) for a specific decision within an urban sustainability transition arena. Notably, the plan lacks the surprise and utopianism of some visions, but does offer more pragmatic development guidance than motivation. The scale of the plan offers tangibility at a high level, but nuanced detail of nested transitions and step-by-step strategy implementation is left to future efforts.

The public engagement length and scale under Transit 2000 was much greater, leaving the CCFPT with somewhat less knowledge of public preferences for this plan than the one passed in 2000. However, based on the student driven public engagement, orienting the public to the scale of the plan's major decisions (i.e. light rail and BRT expansion, system wide frequency and hours of bus service) rather

than to user concerns (i.e. shade at bus stops, refillable fare cards, Wi-Fi on transit) was difficult to achieve, even though user concerns were a substantial minority of the expenditures under discussion.

All told, the ASU team's process addressed its initial research goals. Students helped articulate Phoenix citizens in the CCFPT process through their survey work as well as stakeholder engagement for producing the posters. CCFPT member preferences for transportation priorities were communicated through the prioritization activity, and the workshop itself presented a crucial opportunity to support the CCFPT's decision-making.

Limitations. There were several limitations to the current work. First and foremost, only a subsample of the CCFPT members responded to the process satisfaction survey, our primary outcome measure. Based on this, it is plausible that the estimates of satisfaction are biased towards those individuals on the committee that had extreme views about the workshop. This is somewhat confirmed based on the strong bipolar responses within the survey, with more limited responses in the middle range. As such, the survey results must be interpreted with caution. That said, the coding exercise did appear to support the general conclusions of the survey results.

A second limitation is that, at the time of writing this article, the outcome of the overall process is still unclear, with the ballot yet to come to a vote. As such, the final data-point for judging the quality of the process is not yet available. Finally, as this was a naturalistic iterative design research process, it was impossible to establish an appropriate control group. Thusly, no claims of causality can be inferred from this work. That said, we hope the great deal of description in the work, coupled

with a grounded model for evaluation, ultimately supports effective insights for the design of future opportunities.

Conclusion

Overall, results of this process suggest that the CCFPT was an effective transition arena that met nearly all of the criteria established by Harlow et al. 2015. Based on the current results, it is predicted that the ballot has great opportunity to pass. The requisite work for establishing an actionable and meaningful ballot initiative that balances constituency interests was established. That said, this can only be fully confirmed after August of 2015.

Results from this paper focused primarily on the work of the ASU team to facilitate the process. As suggested earlier, it appears that the facilitation tools created in partnership between the ASU team and the City of Phoenix Public Transit Department, with feedback from the CCFPT, did ultimately result in a process with good process satisfaction. We cannot stress enough the importance of the massive amount of work that was done prior to this prioritization workshop to set the stage for the workshop conversation. Future research can continue to explore how mensuration and evaluation can better facilitate effective designs for similar work.

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Chapter 5

Conclusion

The purpose of this dissertation was to better identify "just in time" decision points within a transition, and to articulate a draft set of evaluative criteria for the "proximal outcomes" of decisions made by transition arenas. These draft criteria are only a logical first draft that future research should iterate upon, but are hoped to be of use in designing transition decision points within transition points in the present. To inform the proposed criteria, this dissertation described initial engagement with potential transition agents to articulate a plausible strategy for identifying the transition agents who might participate in transition arenas.

Reinvent Phoenix is an instructive case study of a planning exercise within a transition that partners academics with municipal employees. For the success of such partnerships in the future, as well as the success of urban sustainability transitions, the lessons learned from this case have been collated to a first draft hypothesis on plausible best practice steps. These best practices advance from previous literature as previous suggestions for supporting transitions and transition arenas were almost entirely based on logic and reason, with very little hands on experience driving suggestions. The suggested steps were based on hands-on experience that can be thought of as a first draft hypothesis or sketch that can be better evaluated in subsequent work. A central contribution of this work is the establishment of a pragmatic strategy (i.e., the development of a sketch understanding of stakeholder interactions) that fills the gap between the exhaustive and time-consuming stakeholder analysis and mapping aspired to in the literature, and the time constrained complexity of urban sustainability transition projects. In

future work, the concept of a stakeholder sketch as a pragmatic strategy for organizing early-stage transition agents within a transition arena should be evaluated.

Transition arenas are a critical area of research that need further study to determine their effectiveness in urban settings. The multi-scale challenge (Nevens et al., 2013) makes evaluating that effectiveness difficult, because of the inherent complexity of urban sustainability transitions. Ideally, evaluative criteria could be applied and used to innovate at each discrete step in a transition. However, transitions are messier than linear steps, time can be in short supply, and evaluative criteria are not always articulated.

This dissertation aims to fill the gap in evaluative criteria at one scale in the multi-scale challenge: specific decision points for transition arenas within urban sustainability transitions. Again, a key focus of this dissertation was to establish a first-draft hypothesis about criteria that could be used to evaluate a transition arena decision point that is based not just on the previous literature but also real-world experience in a specific transition arena decision point. These criteria use that lens to evaluate transition agent participation, transition arena setting, and decision facilitation tools. As more transitions progress and come to fruition, evaluation of key decisions, these criteria can be evaluated themselves and, if proved useful, can help aid in the more systematic development of future transition arena decision points. Evaluating specific decisions using the entire context of the transition arena model can help researchers understand the dynamics of urban sustainability decision points, and design the best possible versions of future decision points. If these criteria prove valuable in subsequent transition arenas, they can become a

checklist that could be shared with urban professionals actively involved in decision points to help guide their process towards more effective transition arenas, particularly those that facilitate more absorptive rather than quid pro quo style interactions.

The application of this dissertation's criteria to the CCFPT prioritization workshop showed that it met nearly all those expectations. City staff did much of the work to meet the criteria by creating and facilitating the CCFPT meetings, which set the stage for the workshop conversation. Results from that research focused primarily on the subsequent work of the ASU team to facilitate the workshop. As suggested earlier, it appears that the facilitation tools created in partnership between the ASU team and the City of Phoenix Public Transit Department, with feedback from the CCFPT, did ultimately result in good process satisfaction. One key fact associated with process satisfaction was the perception of participants that the workshop changed people's ideas about transportation. The conclusion from that survey data is that the opportunity to express and explain their ideas in small groups with a clear structure for evidence-based decision-making may have helped participants create an absorptive rather than quid pro quo discussion, and therefore a more empathetic (among the CCFPT members) result. Based on those results, it is predicted that the ballot has great opportunity to pass. However, this can only be fully confirmed after August of 2015.

Limitations

The research in this dissertation was limited throughout by time constraints and thus limited time to develop robust evaluation criteria. Though it's possible that the JITAI model may provide better anticipation of fruitful decision point

interventions, this is balanced with the propensity of urban sustainability transitions to have emergent opportunity spaces with very short timeframes for intervention. Due somewhat to those time constraints, the research in this dissertation often used post hoc analysis rather than a more traditional process beginning with a thorough data collection and analysis strategy. One example of this is the correlation of the data collection and analysis for the CCFPT workshop. With more time, ideally the data collection and analysis strategy would have evolved to be a platform for clearer conclusions about not only meeting the criteria in Chapter 3, but also about the plan produced.

Working as an academic, but outside academia also presents challenges with establishing a control. Though it would have been possible to facilitate one CCFPT group in a different way, this would either have required development of a second activity or simply not using the activity with one group. A robust second activity was not possible under the time constraints, and not using the activity with one group did not serve the greater purposes of the transition. This was a single chance to create an effective decision point for what became a $30 billion plan, and subsuming that to research goals that required a control would have been irresponsible to the public.

In line with this, the work would have benefitted from more empirical testing. The steps in Chapter 2, the criteria in Chapter 3, and the activity in Chapter 4 could all improve through careful research design, mensuration, and evaluation to establish their true effectiveness. However, these products were developed as draft hypotheses meant to support future research in transition arenas

that is based not only on the previous literature but also first-hand experience, and ideally will be refined in future research settings.

Future research

Future research in this line could individually test each of the proposed steps to overcome common stakeholder engagement challenges, as well as each of the criterion for decision points for transition arenas within a transition. Further, research about the connectivity between the steps and criteria, and each as a holistic set, could benefit both researchers and transition agents. There is also the next step beyond evaluating the quality of a decision point, and actually evaluating how well the decision made contributes to the envisioned transition, and how much the proposed steps and criteria support curation of decision points that do so. A central hypothesis that requires further validation but that is a central guiding principle for this work is the desire to facilitate more absorptive styles of interaction within democratic processes rather than the more classic tit for tat/quid pro quo strategy. We see this as essential as often the classic quid pro quo style of interactions results in public decisions that are a piece-meal of ideas rather than exhibiting a common vision of how the public shall move forward together. In future work, a core focus should be on better articulating and plausibly even measuring different styles of interactions during decision-making processes that might suggest a more absorptive and integrative interaction style is occurring as opposed to merely quid pro quo interactions. Our coding strategy of the workshop is a first-draft attempt to do this, but future work is required to further refine this approach.

There are a host of other interesting questions to ask about the burgeoning field of urban sustainability transitions: How might we be able to further evaluate

the quality of these criteria via past decisions? Which future decisions might be particularly useful for testing the quality of the criteria? Where else can specific criteria hone the activities of transitions to address the multi-scale challenge? Urban sustainability transitions face these, and many other open questions. To move the focus of scholarship in this field from analysis to action, we must evaluate rather than analyze, and use that evaluation for agile innovation throughout the complexity of urban sustainability transitions.

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APPENDIX A

REINVENT PHOENIX SURVEY

Reinvent Phoenix Survey

This 19-question survey is designed to find out what is important to you about future development around Phoenix's new light rail. It is part of a long-term grant received by the City of Phoenix, called 'Reinvent Phoenix,' which will update city plans for areas around the light rail. Your participation in this effort is greatly appreciated.

Section 1.

Question 1. What three things do you love most about your neighborhood?

a.
b.
c.

Question 2. What is your big idea for the future of your neighborhood?

Section 2. Imagine that there are several empty buildings within walking distance of your home. Neighbors and community organizations would like to see these buildings put to use, and have proposed many different uses.

Question 3. Which of the following jobs would you want to have in those empty buildings? Check all that apply.

- ☐ Construction
- ☐ Auto Mechanics
- ☐ Doctors Offices
- ☐ Hair and Nail Salons
- ☐ Law Offices
- ☐ Architecture Offices
- ☐ I would prefer not to have businesses in my neighborhood

Question 4. Which of the following businesses would you want to have in those empty buildings?

a. A business that creates a few jobs for people in your neighborhood, but minimally increases traffic
b. A business that creates a lot of jobs for people in your neighborhood, but significantly increases traffic
c. I would prefer not to have businesses in my neighborhood

Question 5. Imagine an old building in your neighborhood is going to be converted into a retail store. What would you prefer to see happen in this situation?

a. I would like the building to be torn down and replaced with a new building
b. I would like the building to be left standing and reused
c. I prefer not to have a retail store in my neighborhood

Question 6. Which of the following neighbors would you prefer to have? Check all that apply.

- ☐ A Construction Worker
- ☐ An Auto Mechanic
- ☐ A Doctor
- ☐ A Hair Stylist
- ☐ A Lawyer
- ☐ An Architect
- ☐ It does not make a difference to me what my neighbors do for a living

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Section 3. Imagine that 10-15 years into the future, some neighborhoods throughout the Valley have updated their main streets with wider sidewalks, bike lanes, and better connection to light rail and extended bus routes. Some taller buildings with cafés, medical offices, and clothing and grocery stores have appeared on the main street of these neighborhoods. Some people you know have recently moved into apartments above the stores. You and your neighbors are beginning to think about what changes you would like to see in your own neighborhood.

Question 7. In the future just described, imagine that a small store or office is being proposed for somewhere in your neighborhood. How close to where you live would you be comfortable having the small store or office?

a. On my block
b. A couple blocks away from where I live
c. Not in my neighborhood

Question 8. In that same future, imagine that a retirement center is being proposed for somewhere in your neighborhood. How close to where you live would you be comfortable having the retirement center?

a. On my block
b. A couple blocks away from where I live
c. Not in my neighborhood

Question 9. In that same future, a 4-story apartment building is being proposed for an empty lot somewhere in your neighborhood. How close to where you live would you be comfortable having the building?

a. On my block
b. A couple blocks away from where I live
c. Not in my neighborhood

Question 10. Now, imagine that the first floor of the 4-story apartment building would be a full-service grocery store and pharmacy, open to the public. Does this change how close to where you live you would be comfortable having the building?

a. Yes, I would want the building to be farther away
b. Yes, I would be willing for the building to be closer
c. No, this would not change how close I would want the building to be

Question 11. In that same future, imagine that a new entertainment facility (e.g., a movie theater, a skate park) has been proposed nearby where you live. How close to where you live would you be comfortable having the entertainment facility?

a. On my block
b. A couple blocks away from where I live
c. Not in my neighborhood

Question 12. In that same future, a new development on the main street has been proposed with a mix of housing and office or retail space to employ people from the neighborhood. Which mix would you prefer?

a. Mostly housing with not much office or retail space
b. An even mix of housing and office or retail space
c. Mostly office or retail space without much housing
d. I would be opposed to the development

Section 3. (Continued) Imagine that 10-15 years into the future, some neighborhoods throughout the Valley have updated their main streets with wider sidewalks, bike lanes, and better connection to light rail and extended bus routes. Some taller buildings with cafés, medical offices, and clothing and grocery stores have appeared on the main street of these neighborhoods. Some people you know have recently moved into apartments above the stores. You and your neighbors are beginning to think about what changes you would like to see in your own neighborhood.

Question 13. In that same future, a shopping center with a playground in a small park is being proposed for an empty lot somewhere in your neighborhood. However, the more parking space at the shopping center, the smaller the playground/park will be. How much parking would you want the shopping center to have?

a. The same amount of parking as other shopping centers, and no playground/park
b. Slightly reduced parking to allow for a small playground/park
c. Not much parking to allow for a large playground/park
d. I would be opposed to the whole project (the shopping center and the playground/park)

Question 14. In that same future, a park with playgrounds, sports fields, and grills has been proposed in an empty lot across the street from where you live. It's expected that many people would often use this park. How supportive would you be of the park proposal?

a. I would be opposed to the park proposal
b. I'm not sure how supportive I would be of the park proposal
c. I would be supportive of the park proposal

Question 15. In that same future, there is a proposal to add bike lanes to streets in your neighborhood that have 2 lanes of traffic in each direction. Which of the following would you support?

a. Replace one car lane in each direction with a wide bike lane separate from cars
b. Keep all the car lanes and add a narrow bike lane where bikes ride next to cars
c. Do not add any bike lanes

Question 16. In that same future, in order to make streets safer, there are plans to reduce the speed limit or to add speed bumps on some roads in your neighborhood. Where in your neighborhood would you like to see these changes?

a. On my street
b. A few streets down from where I live
c. Not in my neighborhood

Question 17. In that same future, imagine you are looking to move. Which of the following locations would you be most likely to consider?

a. A place where you must drive to get to the local stores
b. A place where you can drive or take the bus to the local stores
c. A place located where you can drive, take the bus, take the light rail, or cycle to the local stores
d. A place in the center of the community, where you can walk to the local stores

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Please turn over for the final sections.

Section 4. Imagine a neighborhood nearby where you live plans to support a mix of residents with different income levels by offering a wide variety of housing and employment options.

Question 18. What do you think the effect of this plan would be?

a. The plan will likely create a diverse and strong community.
b. The plan will likely create tensions between residents.
c. The plan will likely have no influence on the character of the community.

Question 19. How attractive would this neighborhood be to you?

a. Very attractive – I would consider living in this neighborhood.
b. Somewhat attractive – I would consider working or doing recreational activities in this neighborhood.
c. Not attractive.

Section 5. Tell us more about yourself and where you live and work.

What year were you born? _____

Are you: ☐$_1$ Male ☐$_2$ Female

Are you *(Please check all that apply):*

☐$_1$ Hispanic/Latino ☐$_4$ White/Caucasian
☐$_2$ Black/African American ☐$_5$ Pacific Islander
☐$_3$ Asian American ☐$_6$ Native American
☐$_7$ Other (*Please specify*)
_____

How many persons (INCLUDING YOURSELF) are in your household?

_____Adults (18 & over)
_____Children (17 & under)

Are you :

☐$_1$ Employed full time
☐$_2$ Employed part time
☐$_3$ Student
☐$_4$ Unemployed/Homemaker/Retired

What is your profession?

This survey is part of a planning process for the Gateway District (roughly 21th Street on the West to 44th Street on the East, and from the Sky Harbor Aiport to the South, to the 202 freeway on the North)

If you live in this area, what are the closest cross streets to your home?

Do you rent or own the place where you live? (Circle one) **rent own**

If you work in this area, what are the closest cross streets to your workplace?

If you own or manage a property in this area, what are the closest cross streets to your property?

To stay involved in this process, or for any questions you might have, please contact John Harlow by email john.harlow@asu.edu or phone (480) 217-6333. Thank you very much for your time and participation.

APPENDIX B

ACTIVITY INTRODUCTION SCRIPT

Framing from Maria (3 min read at a slow speed)

Welcome and thank you for being here on a Saturday morning. Today will be the next step in the process of prioritizing elements for the transportation plan. By noon, each team will have produced a representation of their funding priorities. After this meeting, staff will review all the teams' scenarios for commonalities and differences, and provide input to the Committee. At the next meeting, the Committee as a whole will resolve divergent priorities, and at the final scheduled meeting of the year, you will focus exclusively on how to raise the revenue that would fund the plan.

In front of you, there is a visualization of everything that has been presented to you in the committee meetings. Each potential funding priority from the spreadsheet in your packet is represented here as a card. The size of each card is proportional to its cost, with one inch being approximately $23 million. The cards are laid out on a surface area that represents total revenue over a 2020—2050 timeline. You can see that the more surface area the cards cover, the more revenue is required for funding.

Our Deputy Public Transit Director has worked on the projections to factor in supplemental federal funding as well as uncertainty about future costs and economic conditions. We want you to know that the numbers for both the revenue and cards are soft, because there's lots of variability in predicting costs and economic conditions 30 years into the future. We're here today to prioritize, so let's accept that the numbers are necessarily rough, but sufficient to identify priorities.

Each team has a staff facilitator and three maps to assist with prioritization: 1) a map of transit in the city; 2) a map of projected population and employment density; and 3) a map of ????????? . Your facilitator will walk you through each category of cards so that your team can identify priorities. The categories are color coded, so that you can find the cards more easily. Once you have discussed all the potential funding options, your facilitator will capture your work with a picture for staff to review before the next meeting.

If you have any questions that your facilitator cannot answer during the process, Ken and ????? and myself will be floaters to address anything we can. Any questions or suggestions you have outside this structure (a card you'd like to add, for example) or relevant for upcoming meetings (for example, how to raise revenue) will be captured in your facilitator's notes as well as on the audio recording, just like our regular meetings.

Questions?

APPENDIX C

FACILITATION GUIDE

Facilitator Guidelines

- We have 3 hours, and the more relaxed you are, the more relaxed your team will be.
- We want to know the committee's priorities, so they should handle the advocacy.
- We are not recommending a tax rate. There are many ways to reach a revenue total, including alternative funding possibilities they can discuss at upcoming meetings.
- It's up to you
    - whether you move the tiles or the committee members move them
    - whether you reconfigure the tiles as you go or at the end

Framing from Facilitators

Before Maria speaks:

- Greet each committee member and introduce yourself if you don't know each other. Ask them if they've seen the name tags if they don't have one.
- Once they're sitting and settled, invite them to take a look at the cards. Explain that the cards correspond to the spreadsheet in their packet. Show them that the back of the cards have more information, but preserve the initial setup of the cards.
- If they start asking about the activity, feel free to explain the instructions, even if everyone isn't there. The early arrivals will help you explain later.

After Maria speaks:

- Ask your team if they have any questions. Answer those you can.
    - If there's a relevant question you can't answer, call over a floater.
    - If there's a question about a future part of the process, or one that distracts from the exercise, take a note of it in your "parking lot," and move on.
- Refer to the sidebar, and explain that staff has projected a sales tax range that would raise each revenue level under different economic conditions because we cannot predict how good the economy will be between now and 2050.
- Explain that the cards are based on the committee's priorities, the public outreach effort, and all the information that staff has presented.
- Make sure everyone knows that there is additional information on the back of the cards.

Process

You'll walk the committee members through the spreadsheet, using the following script. For each category, you can just read what's italicized and point to the relevant card(s):

Existing Service

- *OK, let's get started with existing service at the top of your spreadsheet.*
    - *Would you like to maintain current bus and dial-a-ride service?*

- *Would you like to maintain current light rail and dial-a-ride service?*
- *Would you like to make the necessary technology replacements and upgrades, such as fare collection, GPS, and scheduling to maintain existing transit service?*
    i. If yes to all three, leave the cards as they are, and move to the next category
    ii. If no to any of these three. The exercise is over.

Span of Bus Service (hours of operation for the bus system)

- *Now we'll move to span of service, the hours of operation for the bus system. You can choose one of three options:*
    - *Change bus service hours to match the light rail*
        i. (5am—11pm Sun—Thurs and 5am—2am Fri & Sat)
    - *Make bus service 24 hours a day*
    - *Maintain existing bus service hours*
        i. Remember, existing hours is included in the existing bus service card.

Frequency of Bus Service (how often the bus comes)

- *Next, we'll look at frequency of bus service, how often the bus comes. First, you'll choose one of three options for peak frequency:*
    - *15 minutes or less peak frequency on all bus routes*
    - *15 minutes or less peak frequency on 60% of bus routes*
    - *Existing peak frequency (????)*
        i. Remember existing frequency is included in the existing bus service card.
- *Now, you'll choose one of two options for frequency of all service:*
    - *30 minutes or less frequency for all bus routes*
    - *Maintain existing bus frequency (????)*

Bus Service Expansion (where the bus goes)

- *Ok, let's decide where the bus goes. You can choose one of four options:*
    - *Add bus service to unserved major streets with 15 minute peak frequency*
    - *Add bus service to unserved major streets with 15 minute peak frequency on 60% of new routes*
    - *Add bus service to unserved major streets with 30 minute peak frequency*
    - *Maintain existing bus service*
- *It is also possible to add new RAPID or Circulator service. There are four options:*
    - *Add both new RAPID and new Circulator service*
        i. Locations for new service would be chosen based on demand
    - *Add only new RAPID service*
    - *Add only new Circulator service*

- *Maintain existing RAPID and Circulator service*

City Council Approved Light Rail

- *OK, it's time to discuss the light rail projects that city council has already approved. Let's go through them one-by-one. Please feel free to refer to the large map, or the back of the cards, for destination information. For each card, you can either include it in the transportation plan, or remove it.*
  - Read the title of each card in turn and let the team discuss whether or not it should be in the transportation plan.

High Capacity Transit (HCT) Corridors: Future Bus Rapid Transit (BRT), Streetcar or Light Rail

- *Next are the high capacity transit corridors. Again, we'll go through them one-by-one and you can refer to the large map, or the back of the cards, for destination information. For each card, you can either include it in the transportation plan, or remove it.*
  - Read the title of each card in turn and let the team discuss whether or not it should be in the transportation plan.
  - Remember: all these cards are costed as light rail, the most expensive of the three options. If your team wants to specify BRT or streetcar for certain projects, make a note of that, and assure them that those details will be worked out in the next phase of the process.

Future Bus Rapid Transit (BRT)

- *Now we'll move to corridors that make sense as bus rapid transit (BRT), in the same way we did high capacity transit corridors.*
  - Read the title of each card in turn and let the team discuss whether or not it should be in the transportation plan.

Infrastructure Improvements

- *At this point, we're done with specific transit improvements, and you'll now choose what supporting infrastructure will be in your plan. Again, we'll discuss each card in the category one-by-one, choosing whether or not to include it in the plan.*
  - Read the title of each card in turn and let the team discuss whether or not it should be in the transportation plan.

Infrastructure Improvements

- *Lastly, it's time for complete streets. For this category, you can choose one of five options:*
  - *Complete streets for all existing high capacity transit corridors, all new high capacity transit corridors, and all new bus corridors*

- *Complete streets for 50% of existing transit corridors and all new high capacity transit corridors*
- *Complete streets for 25% of existing transit corridors and all new high capacity transit corridors*
- *Complete streets for all new high capacity transit corridors*
- *No complete streets investments*

Picture

- If the cards have not been rearranged, group them to estimate the revenue level, then take a picture.
- If there is more time, and we need to maintain quorum, move to the next section.
- If time is up, thank your team. Then, read them all the things in your notes that staff will follow up on, or that will be addressed in future meetings, so that they know they have been heard.

Tier 2 Priorities (for early finishers)

- *Ok, this tells us what you want in the plan, and the approximate revenue it will take. Now let's assume the scenario from Transit 2000 of a bad economy. If you had to take $5 billion out of this plan, which tiles would go?*
  - Let the team discuss what investments should be removed from the plan.
  - Once they have finished, take a second picture.
  - Thank your team. Then, read them all the things in your notes that staff will follow up on, or that will be addressed in future meetings, so that they know they have been heard.

<u>Glossary</u>

- ADA: Americans with Disabilities Act
- ASU: Arizona State University
- BRT: Bus Rapid Transit
- CNG: Compressed Natural Gas
- HCT: High Capacity Transit
- T2000: Transit 2000: The Phoenix Transit Plan

APPENDIX D

INVESTMENT TABLE

Plan Elements Worksheet

Category	Card	Back of Card / Specific Details	Cost (millions)
Existing Service	Bus & Dial-a-Ride	Continue currently provided service, maintenance, and federally required dial-a-ride	11,803
	Light Rail & Dial-A-Ride	Continue currently provided service, maintenance, and federally required dial-a-ride	2,142
	Technology upgrades and replacements	Maintain fare collection system, scheduling, GPS tracking in a state of good repair	270
Span of Bus Service (Hrs of Operation)	Bus matches Light Rail service	Provide service for early morning or late night travelers (would fulfill T2000)	1,454
	24 hour bus service day	Provide service for travel any time of day or night	1,849
Frequency of Service	15 minute peak frequency on all bus routes	Decreases waiting and improves connectivity on all routes (would fulfill T2000)	1,818
	15 minute peak frequency on 60% of bus routes	Decreases waiting and improves connectivity on some routes (would partially fulfill T2000)	1,072
	30 minute frequency for all bus service	Higher frequency on routes with greater than 30 minute frequency, especially weekend service	755
Service Expansion (New Bus Service)	Add bus service to unserved major streets at 15 minute peak frequency	Provide connectivity to unserved areas of the city (would fulfill T2000)	1,606
	Add bus service to unserved major streets with 60% of new routes at 15 minute peak frequency	Provide connectivity to unserved areas of the city (would partially fulfill T2000)	1,453
	Add bus service to unserved major streets at 30 minute peak frequency	Provide connectivity to unserved areas of the city (would fulfill T2000)	1,223
	new RAPID service	Provide connectivity to unserved areas of the city	80
	new Circulator service	Provide connectivity to local service in unserved neighborhoods	300
Approved Light Rail	Capitol/I-10 W Phase 1 Rail	Connect existing rail to the Capitol (3 mi)	310
	Capitol/I-10 W Phase 2 Rail (have to Phase 1)	Connect the Capitol to the 79th Ave Park-n-Ride (8 mi)	1,500
	South Central Ave Rail	Connect existing rail to Baseline Road (5 mi)	850
	Northwest Phase 2 Rail	Connect existing rail to Metrocenter (1.7 mi)	250
High Capacity Transit (HCT) Corridors: Future bus rapid transit (BRT), streetcar, or rail	Camelback Phase 1	Connect 19th Ave to 43rd Ave and Grand Canyon University, the 8th highest ridership bus route (3 mi)	500
	Camelback Phase 2	Connect 43rd Ave to 83rd Ave, WestGate, and the Stadium, 8th highest ridership bus route (5 mi)	880
	Baseline East	Connect Central Ave to I-10 (5.5 mi)	1,000
	Baseline West	Connect Central Ave to 59th Ave and the potential future 202 (8.5 mi)	1,200
	Northeast Extension	Connect existing rail to Paradise Valley Mall (13 mi)	2,600
	Northwest / ASU West Extension	Connect Metrocenter Mall to ASU West (5.5 mi)	850
	44th St	Connect existing rail to McDonald Dr, just north of Camelback, a major employment center (4.5 mi)	800
	24th St	Connect Biltmore Fashion Park to Baseline Road, the 4th highest ridership bus route (10 mi)	2,700
	44th St / Tatum Extension	Connect Shea Blvd to the 101, Mayo Clinic, and Desert Ridge Marketplace (5 mi)	960
	Downtown Streetcar	Connect major commercial and employment destinations in downtown Phoenix (5 miles)	750
Future BRT (Bus Rapid Transit)	19th Ave S BRT	Connect existing rail to Baseline Rd, the 3rd highest ridership bus route (9.5 mi)	82
	19th Ave N BRT	Connect existing rail to Happy Valley Rd, 3rd highest ridership bus route (10.5 mi)	91
	Thomas BRT	Connect 44th St to 91st Ave, the highest ridership bus route (18.5 mi)	160
	35th Ave BRT	Connect Baseline Rd to Happy Valley Rd, 6th highest ridership bus route (20 mi)	217
	Bell BRT	Connect Scottsdale Rd to 51st Ave (15 mi)	121
Infrastructure Improvements	All bus stops shaded	Comfort and protection from the heat as desired by passengers	18
	Customer service technology upgrades	Reloadable cards (most popular talktransportation.org idea), wifi, digital signs, real-time data trip planning	30
	ADA enhancements	More convenient ADA access, and vehicle and facility improvements	60
	Security improvements	Increased security	60
	CNG fuel infrastructure and solar installation	Reduce air pollution and operating costs	40
	New Northwest bus operation and maintenance facility	Storage and maintenance necessary for increased bus service.	60
Complete Streets	Existing transit and all new HCT and bus	All existing transit (473 mi); new HCT (60 mi) and bus (97 mi)	2930
	50% of existing transit and all new HCT	50% of existing transit (236 mi); all new HCT (60 mi)	1478
	25% of existing transit and all new HCT	25% of existing transit (118 mi); all new HCT (60 mi)	944
	All new HCT	60 mi	410

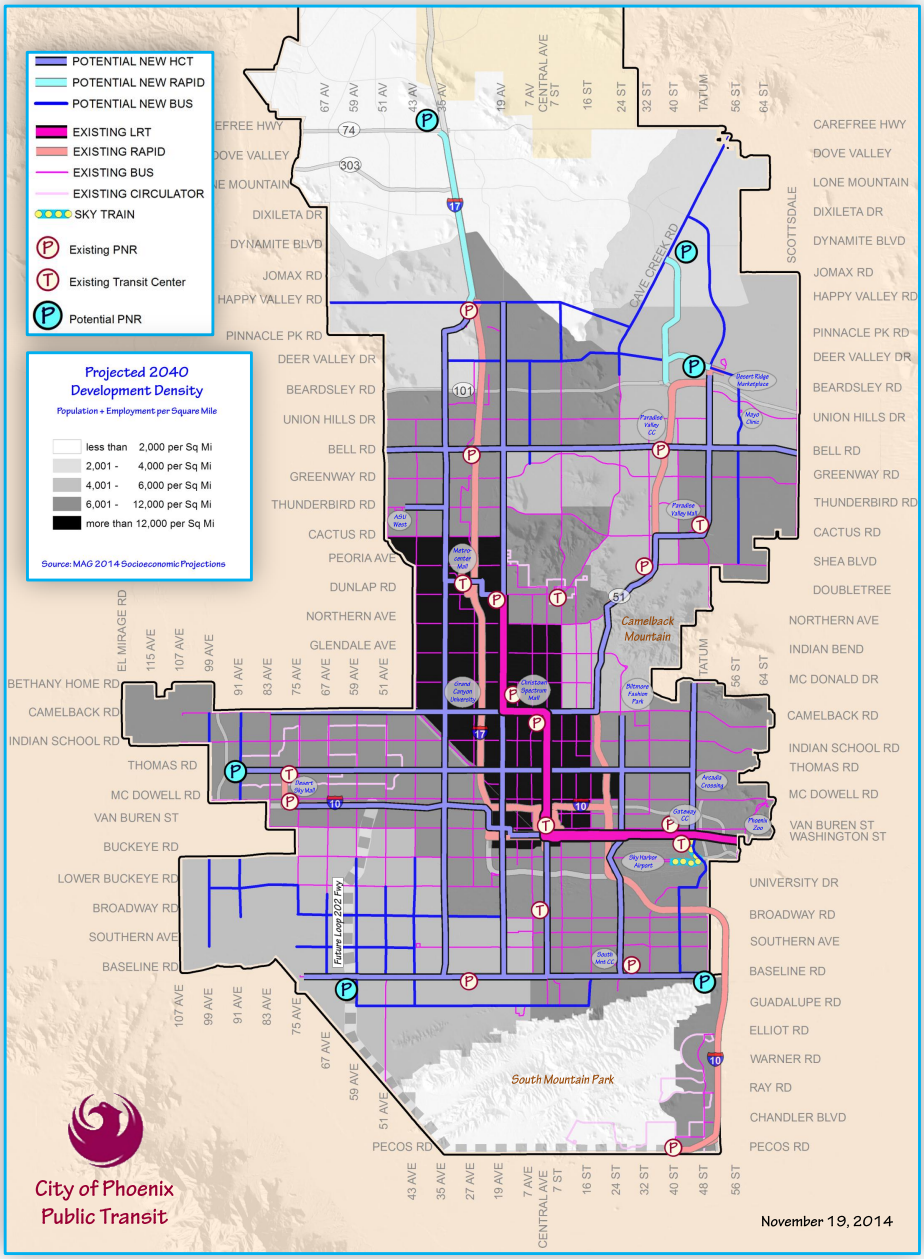
APPENDIX E

MAP OF POTENTIAL TRANSPORTATION SOLUTIONS WITH PROJECTED DEVELOPMENT DENSITY

Citizens Committee for the Future of Phoenix Transportation

Let's Talk Transit Talk Transportation.org

Potential Transportation Solutions with Projected Development Density



APPENDIX F

AUDIO CODING GUIDE

Purpose

These codes will be used to communicate the effectiveness of the workshop prioritization tool in an academic journal article. Primarily, we hope to show whether participants were satisfied with the tool, whether it leveraged data and staff knowledge, whether it supported empathy with the public, and whether it facilitated articulation of rationale.

Introduction

Sorry for the audio quality and background noise. Sometimes, the people at the tables might stand to look at their map, or have two conversations going at once. This will make it difficult to hear, but don't worry too much about it and just try to do your best. The process leading up to this workshop included a series of meetings including packets and presentations of information from staff and experts about transportation in Phoenix. To provide context, I have provided the introduction, the activity script, the information packet, and the transcripts, for your reference. A brief review of these materials will help orient you to the workshop and improve coding.

Coding

Please create a google spreadsheet for code entry, based on the one shown at the training.

1. Please identify the facilitator in your recording, and do not code what the facilitator says (unless it's an answer to a technical question).
2. If you feel any key codes are unnecessary, please make a note and let me know.
3. If you feel any key codes are missing, please make a note and let me know.
4. Statements can be coded as multiple things (e.g. rationale and empathy)
5. Try to code each instance, so if someone offers three reasons in support of light rail on Baseline, code (R) three times.
6. You can code multiple things at the same timestamp, for example if everyone starts talking at once at 00:52:47 and three rationales are given by 00:52:50, feel free to code RRR in the row with timestamp 00:52:47. Try to restrict this to when things get chaotic.
7. When multiple conversations are happening at once, if you can hear more than one, code one, then go back and code the others. Use the notes column if you feel you need to clarify.
8. Please note the best quotes in the Pull Quotes? column, as some quotes will be used in the paper.

Codes with Examples

- Process (P) value judgments (about the tool/workshop) either positive (PP) or negative (P)
    - "I like this process"
    - "This exercise stinks"
    - "I'm happy with what we produced"
    - "This tool is confusing"
    - "I would do this again"
- Empathy (E) with the public

    - "Underserved communities"
    - "Social justice" concerns (poorer, low-income, etc.)
    - "People who ride the bus need to get to work"
    - "Scottsdale residents will never give up their cars"
- Rationale (R) or Rationale by Agreement (RR) for including or removing plan elements
    - "Won't work politically"
    - "Connects x destination to y destination"
    - "Helps people connect between transportation mode"
    - "Costs too much" or "the market…"
    - "Works great in New York"
- Use of data (D)
    - "How much does Baseline East cost?"
    - "The map shows..."
    - "Where is the Transit Book?"
    - "What does the public involvement from the packet say?"
- Use of staff (S) available on the day
    - Asking the table facilitator questions that require their expertise, and are not answered in the available data
    - "Where's Wolf?"
    - "Where's Rick?"

<u>What Not to Code</u>

- Discussions about the logistics of the tool
    - "So we move the cards on the board?"
    - "Can we do the orange cards before the purple?"
- Data that comes from personal knowledge/memory and not from staff or materials
- Agreement and conflict
    - "I disagree"
    - "Yes, Len is right"
- Funding discussions
    - Anything to do with whether or not there should be a sales tax
    - Anything to do with *how* plan elements will be paid for
- Repetition, so if someone repeats the same reason for something, just because they weren't heard, code (R) only once.
- Anything that matches a code but is clearly off topic from the purpose of the workshop

APPENDIX G

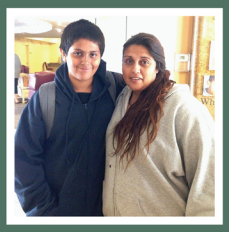
STUDENT POSTERS

These are...

"I am an active member on the Arizona Council for the Blind and know how vital the Dial-A-Ride system is. I have some friends who quit attending classes at the Center for the Blind because they couldn't afford the $64 a month. I am fortunate to be able to pay for Dial-a-Ride and know that without it, I would lose my ability to participate in any activities outside of my home." -Barbara

"I would not be able to attend any of my courses at Rio Salado without Dial-a-Ride. I rely on them to maintain my independence and right to attend classes. I am thankful for what Dial-a-Ride does for me and am able to live a life full of activities because of them". -John

"A friend told me how grateful she is when a bus has extra bike racks. Once she was waiting at a bus stop with her bike and another biker came along. They both could feel the tenseness in the air, especially when the bus a block away already carried a bike or two. It was a great relief that at the end, all the bikes were able to get on the rack and no one needed to wait for the next bus." -Teresa



"Public transit in Phoenix is everything for me. If I didn't have the bus I wouldn't be able to get to my appointments and my son to school. My son goes to school 10 miles away and there is no way he could get there anyway but Phoenix transit. I ride the bus to my doctors' appointments all over the Valley, because I have a bad knee. Public transit is such a big part of our lives and without it I do not know what we would do."
-Maria

"Without the bus system, I would have to walk or ride a bike for miles to get to school. I ride multiple buses to school and rely on them to attend classes regularly. If one part of my route is compromised, I'm probably going to be very late for school."
-Jesus

"The Phoenix Transit system is the lifeblood for many working people - people from a wide range of socio-economic levels who work long hours to support their families, people who either depend on the Transit system as the only possible method to get to work, or who use it to provide a practical alternative to dealing with congested highways, expensivedowntown parking, or even to extend their workday by being able to answer email on their cell phones." -Janet

"The light rail can be fast and convenient. I would use it more often if there was security on it 24/7. I am a single female who travels alone, and many times I do not feel safe using the light rail. I would use public transportation more often and drive less if I felt safer."
–Sally

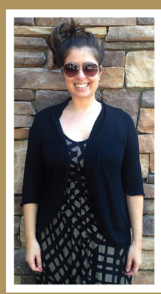
"After my accident, I have been on Disability. I couldn't move half of my body for a long time, but now I can ride my bike wherever I go. Doctor said I can not drive again. It will be very nice to have wifi on the bus and light rail. Expanding the light rail and bus routes will be helpful, too. "
-Andrew

"I tend to walk a lot in Phoenix for work and just to get places. I've come across many roads where there is no sidewalk or it's broken and needs to be repaired. Many times I have to run across the street since there is no crosswalk nearby. I feel badly for the mothers with children who I've seen having to go through the same thing."
-Brandon

our stories.

These are...

"Using Phoenix transit lets me spend more time on the things that matter to me, like spending time with my newborn son."



You won't believe this, I live basically at a lightrail stop, I get a discount on public transit through work but I've never taken it. Even though I work downtown, the lightrail doesn't stop close enough to my work for me to feel safe walking to the stop after work in the dark. It is much faster for me to drive than take the bus. Plus, I have to be ready to meet clients during the day and I don't have time to wait on the bus or light rail.

-Christina

Live in Phoenix and work in North Scottsdale and downtown Phoenix one day a week. Car gets good gas mileage so doesn't worry about distance. It would take too long to drive to a light rail stop, park and then ride to his job downtown. It is much faster and more convenient to drive.

-Kyle

"I live and work in Phoenix but not close to any light rail stops. The bus is too inconvenient and time consuming. The time I would spend waiting for the bus and riding the bus isn't worth the money I might save on gas."

-Irvin

"I have late shift. When I am out of work, LR is still running, but the bus connects to it has stopped. I need to ask my colleague gives me a ride to LR or take a cab. I don't mind to walk a mile home on the weekend from LR station because bus's weekend schedule when the weather is nice."

"If it wasn't for metro I couldn't make it to school. I have no other choice. And school is important to me because I am trying to build a career to help my family. My daughter and wife use the bus as well to run errands and get places."

-Wiley

"I am original from Chicago. It was very odd to me when I moved here to see the light rail is running on the street and stopped for the traffic lights. It doesn't make sense."

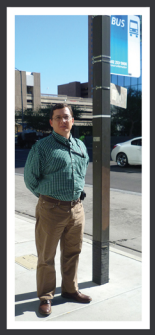
-Johnny

"We need transportation alternatives in the city of Phoenix outside of personally owned vehicles. Not everyone can afford any other transportation outside of the Phoenix Transit system. It is vital to our community."

-Denise

"I get a subsidy from my employer to use the Bus Transit. This cuts down on my fuel consumption, decreases my payments for auto insurance, and I get to read the newspaper every day to work."

-John

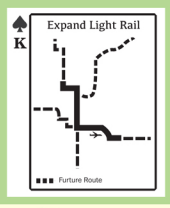


our stories.


These are...
Once the extension of the light rail is finished, it will be much more convenient.
We could use more park and ride lots with safe secure parking.
Add quicker times to encourage the work-force to commute to work on the buses!!
It would not be convenient to be dependent on the light rail schedule.
The buses run on natural gas and they start to break down when temperature is over 100 F. These issues should be fixed, so buses can be on time in summer.
Love public transportation. It's very necessary.
Keep buses and the light rail safer for passengers.
It's very unsafe to be a cyclist in this city. We need more bike lanes, safer road conditions, more shoulders, and increased awareness/education for motorists on how to navigate with cyclists.
I take circulator buses most of the time. To me light rail is for going far away.
My 45-minute commute to and from work is very stressful. By the time I get home, I have no energy to much of anything. Unfortunately, I have no other choice.
If I lived closer to a transportation stop, I would use it more. Right now I have to rely on finding a ride to work. I can only go places when I find someone who has a car.
"Why should I care about that when I have a car?" - Bryan
Bus and light rail schedule doesn't match in Phoenix. The bus stops running much earlier than light rail. This doesn't make sense.
I would love to use more often. It's just a challenge to get to it.
Bus drivers need to be nicer and more helpful in telling riders where the bus stops. Also, the buses need to be more clean.
More shade structures and more trees in downtown Phoenix. We need more walkable areas.
I'm afraid of using the light rail or any other transit here in Phoenix. I don't trust public transportation.
It stops along with redlights which to me is no different than driving my own vehicle and stopping at red lights.
The light rail line should be expanded throughout Metro Phoenix and its immediate surrounding suburbs. This expansion will allow for greater ease of travel to and from the greater Phoenix area.
Add bicycle racks and/or lockers at all park and rides.
I would ride the bus more if there was actually a route that serviced my area. I have to walk over a mile to the nearest stop or get a ride if I want to take the bus.
I wish the bus stop was shaded. My daughter and me do not like waiting in the sun. It makes us feel tired.
I use the bus to get my family groceries. We do not have a car.
Light rail should run 24 hrs. My shift starts at 5 am if I take light rail, which starts at 5 am; I am already 30 mins late. My wife then has to drive me to work.
I think buses are wasteful because they are never full.
All quotes from interviews & talktransportation.org
our voices.

These are...

Survey Result Total Sample : 97



42 votes

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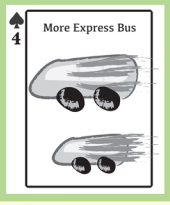
22 votes



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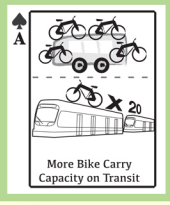
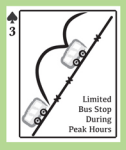
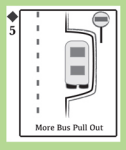


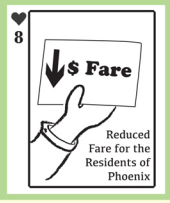
15 votes

I work at the airport. Sometimes they need me in for early shift. I need to walk a mile to get light rail because there is no bus at that time. In summer, it's light out, so it's ok, but in winter, I have to take cab because it's still dark and the sidewalk is bumpy. I hope there is longer and more connections to the airport.

I live in north Phoenix. I need to take two buses to LR and then change another bus to visit my daughter who lives in south Phoenix. It takes me 2 hr one way to visit my daughter on regular basis. It will be much easier for me after the LR expanding to north.







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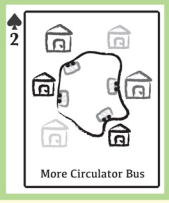

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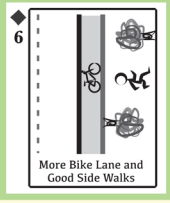

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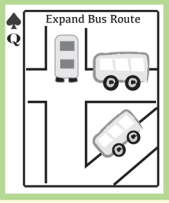


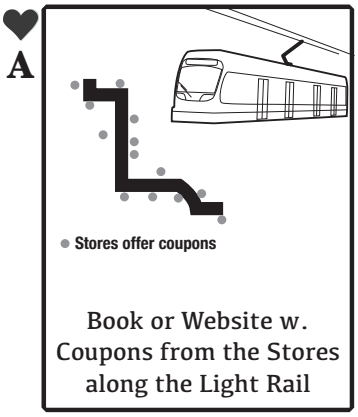
13 votes

11 votes

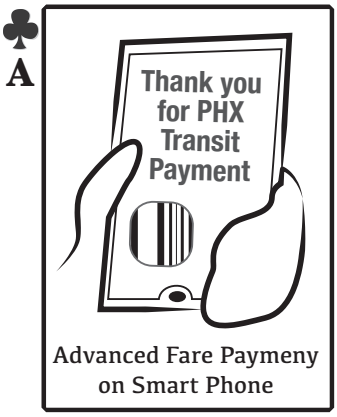
our visions.

APPENDIX H

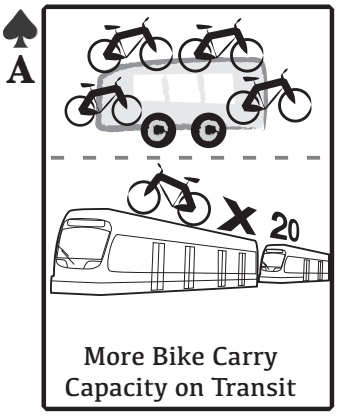
PLAYING CARD SURVEY TOOL



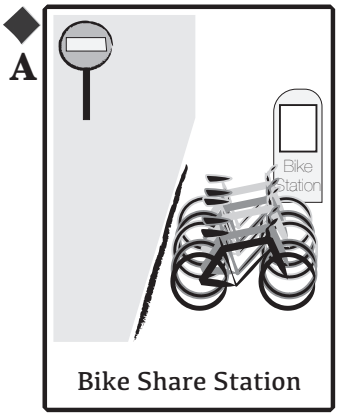
Book or Website w. Coupons from the Stores along the Light Rail



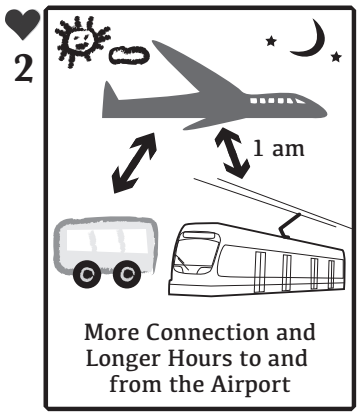
Advanced Fare Paymeny on Smart Phone



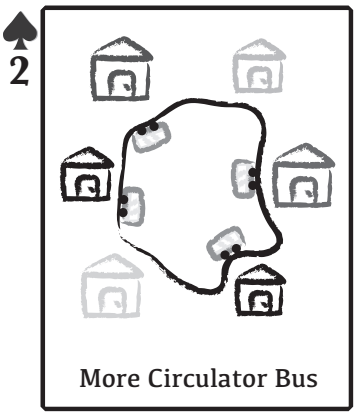
More Bike Carry Capacity on Transit



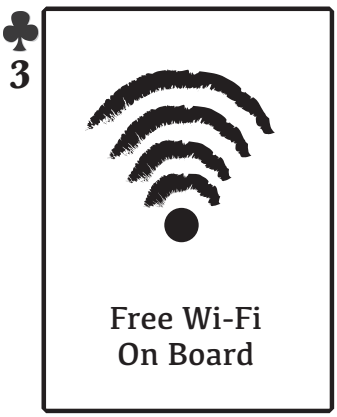
Bike Share Station



More Connection and Longer Hours to and from the Airport

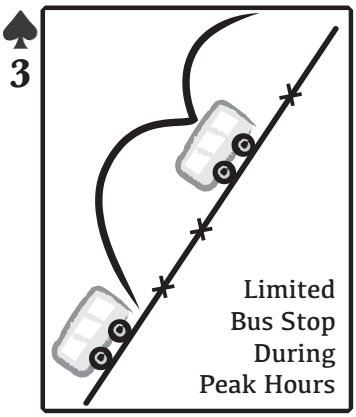


More Circulator Bus

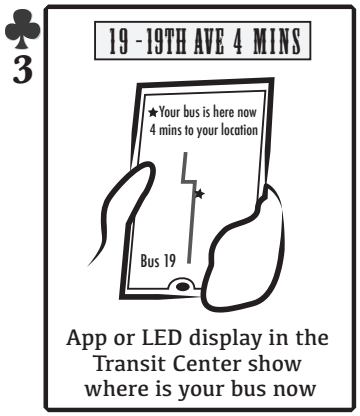


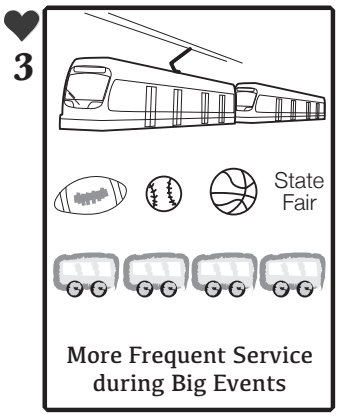
Free Wi-Fi On Board

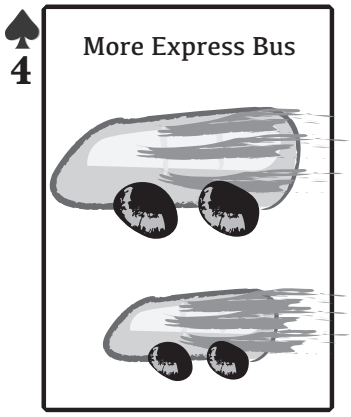
More Easier Disability Access

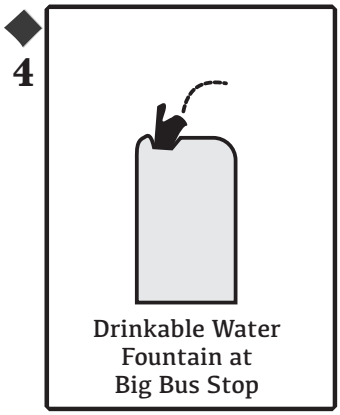


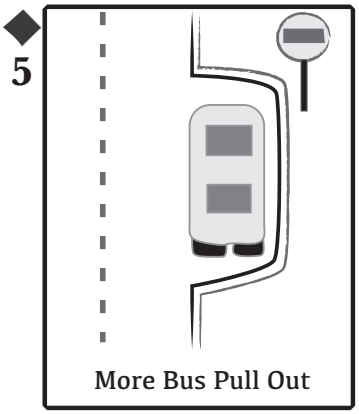
Limited Bus Stop During Peak Hours

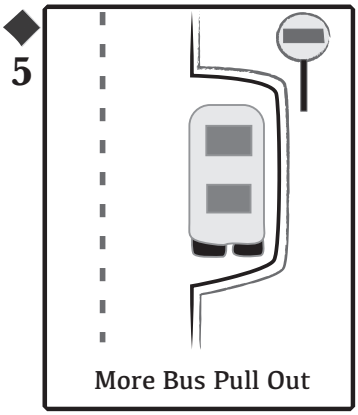

3
19 - 19TH AVE 4 MINS
★Your bus is here now
4 mins to your location
Bus 19
App or LED display in the
Transit Center show
where is your bus now

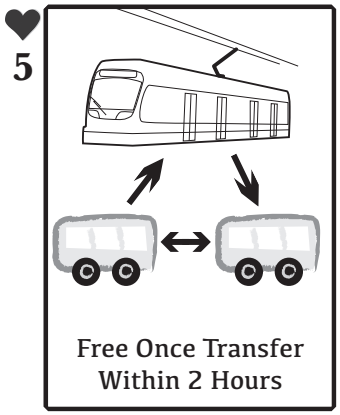

3
State
Fair
More Frequent Service
during Big Events

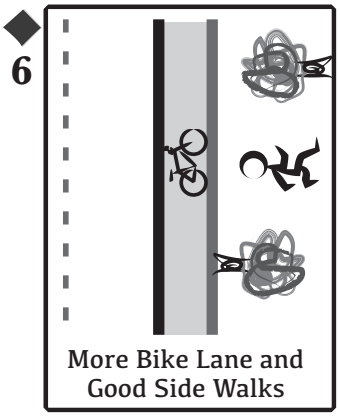

4
More Express Bus

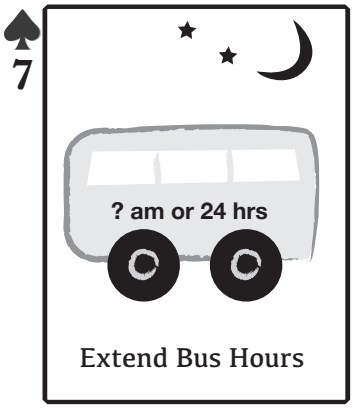

4
Drinkable Water
Fountain at
Big Bus Stop


5
More Bus Pull Out


5
More Bus Pull Out


5
Free Once Transfer
Within 2 Hours


6
More Bike Lane and
Good Side Walks


7
? am or 24 hrs
Extend Bus Hours