

The Pipeline to Better Placemaking: Using Digital Realities to Observe, Teach, & Engage in the creation of Place

HERBERT (TOMMY) JAMES

University Of Central Florida

MATTHEW JOHNSON

University Of Central Florida

ISABELLA WILHELM

University Of Central Florida

Keywords: Placemaking, Digital Engagement, Measuring Place, Augmented Reality, Community Engagement

Quality “Places or Commons” are evaluated by their number of occupants, who is coming there, how long they are staying, and, most importantly, how often they return. Whether the Centre Pompidou in Paris, France, or Mainstreet USA, our places represent who we are as a community. While one could evaluate success by gathering financial numbers from surrounding businesses, they would fall short of the “why” people are there. Immersing your investigation around the “why” a person returns to a place and stays beyond a single reason will start to tell the story of the Place. Place = People + Built Environment.

The Community will come, only if you create with “them” at the start of conceptualization. Using the community as a collective owner in the design process, both directly and through human behavior observations, leads to a design for a regenerative and redistributive commons-based economy or a Community’s Place. We have created the Pipeline to Better Placemaking. A six-stage platform using digital realities to Observe, Teach, & Engage in the creation of Place.

The innovation or uniqueness of this pipeline is in the interactive collection of local knowledge. We are measuring both the built environment and human behavior. Our team has been collaborating with the university psychology department on how to observe human behavior, the computer science department to program multiple prototypes from the ground up, the planning department to better understand zoning laws, and finally, the architecture department to observe the built environment and conceptualize community focused places.

INTRODUCTION:

We are excited to debut the Pipeline to Better Place Making (PBP) platform at the ACSA conference. This year’s theme of Commons fits conveniently into the core principles of the Pipeline. As a society, we are only more recently seeing full-scale revivals of our public commons/places as we move past the 2020 global crisis. Whether large-scale sporting events or

local main street markets, people are coming out of their digital spaces to interact face-to-face. We are done with cameras and mics being turned off; it is time to re-engage. It is time to get back to placemaking. Ardent argues, “No human life, not even the life of the hermit in nature’s wilderness, is possible without a world which directly or indirectly testifies to the presence of other human beings.”¹

Quality “Places or Commons” are often evaluated by the relationships between the built environment and its occupants’ behaviors. Further understanding how the built environment influences and is influenced by human behavior will take us a long way in defining the quality of Place. How does one create a truly successful sanctuary for a community? We can all isolate several great places in our history that impacted us. When done correctly, placemaking creates a cultural hub in the community that brings arts, recreation, socialization, economic vitality, and a place for celebration & mourning. “Citizens create meaningful public space by expressing their attitudes, asserting their claims, and using it for their purposes”²

So how do new and even historically significant places lose their vitality? We at UCF believe this occurs when the creation/modification of Place does not center itself around humanity. While the term “placemaking” has a vague beginning, the concept is thought to have first emerged through the influential publications of writers such as Jacobs and Lynch in the early 1960s. Later, Tuan, Whyte, and Sime advocated for a more human-centered approach to the rapidly growing urban areas in the 1970s³.

OUR APPROACH:

For three years, we have been working on a guide we call the Pipeline to Better Placemaking (PBP), using Digital Realities to Observe, Teach, & Engage in the creation of Place. As designers, we should understand the qualities of the existing Place and how it is used before ever modifying it. Our faculty and students are currently completing the following prototypes and testing the platform’s ability to function as a local community tool to engage a project during the design process better.

Whether the Centre Pompidou in Paris, France or Mainstreet USA, our places represent who we are as a community. While one could evaluate success by gathering financial numbers from surrounding businesses, they would fall short of the “why” people are there. Immersing your investigation around the “why” a person returns to a place and stays beyond a single reason will start to tell the story of the Place. Place = People + Built Environment. Turning a shared vision into a reality, a truly great place, means finding the patience to take small steps, to listen truly, and to see what works best in a particular context. (See Figure 1)

STEP 1 MEASURING PLACE:

When considering what came first, the public Place or the occupants, one must concede a public place does not exist without the public. At the earliest times, humans naturally formed these locations through everyday needs, such as communication, celebration, comradery, access to natural resources, etc... A culture or history was formed from these primitive community gatherings, creating further contact, access, and social activities. Very few public places are assembled entirely from the ground up. Most evolve from these existing conditions. To say an ideal model to copy exist would be imprudent. However, the micro lessons we can learn from the more successful and longer existing public places can be excellent tools to apply human-centric designs as we move forward.

The first step of the Pipeline to Better Placemaking will use these time-tested tools to measure the quality of Place. Not one of these tests stands alone as a marker of success. Like an

ingredient in a good entrée, each tested items come together as an assembly to create a Place.

This research will analyze the interaction between human behavior and the built environment. (See Figure 2 &3)

Process:

1. Administer sets up overall projects and tests for a client. i.e., municipality, developer.
2. Survey team is gathered and made up of community members and architectural and planning students to assess the current site.
3. Team members sign up for multiple 10-30 minute testing slots to measure different behavior activities or built environment elements within those spaces during various times of the day.

Analysis

1. Import collected information to our web base Pipeline Hub to process the data into interactive maps, charts, and graphs.
2. Using data collection, analyze the areas where results of specific human behavior correspond to the built environment elements.
3. Cross-analyze with other tests to determine if occupants in this space tend to avoid areas where disorders seem to exist.
4. Determine what elements within the built environment must multiply to allow a more successful public space.

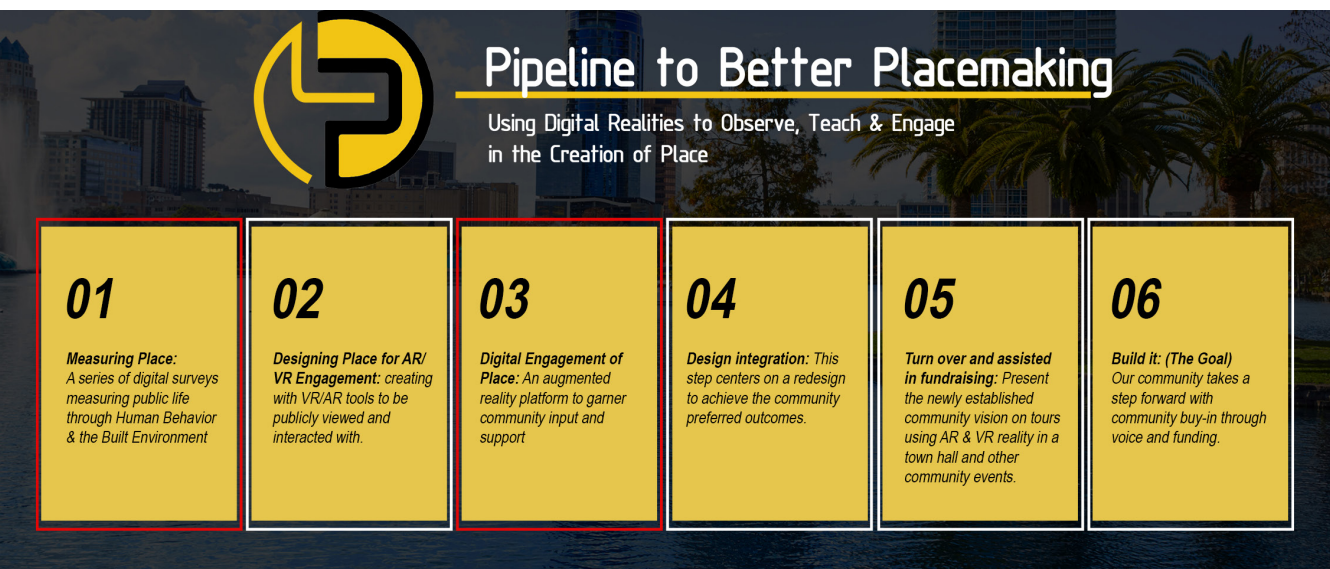


Figure 1. Pipeline Steps. Pipeline to Better Placemaking.

Human Behavior

People in Place and Motion:

Good architecture and urban planning can safeguard against poor interactions between public life and public space.⁴ During step 1 of the Pipeline to Better Placemaking, survey points are positioned over select urban areas to trace and map pedestrian movements, which is the first step toward understanding how a space works.⁵ This information is critical for architects and urban planners to ascertain where to-movements occur and where through-movements occur.⁶ The data collected can also inform the design and planning of pedestrian facilities as well as wayfinding techniques in public spaces.⁷ Using line diagrams derived from the aerial footage, we hope to better understand collision negotiation, route choices, and general movement patterns, which can lead to increased traffic flow, reduce jaywalking, and enhance crossing safety at intersections.⁸ It is also possible to use this data to illustrate to planners how the placement of public transit, parks, and seating can increase the frequency of occupation in areas of rest, i.e., bus stops. Doing so can promote a greater sense of security and well-being in urban environments and provide the social benefits of shared activity.

Measurables for Analyzing Human Behavior at the site,

1. Identify and examine the locations of occupants in the existing public space
2. Identify and examine the patterns of occupants in the existing public space
3. Cross analyze how of population correlate to the built environment.
4. Examples of People in motion test: Where and how are the occupants moving.
5. Examples of People in Place: What activity and where are the occupants.
6. Examples of questions for Survey: how they arrived, how far did they come, how long do they intend to stay.

Built Environment:

Spatial Boundaries (defining edges)

From early times, walls were perceived as places of shelter and protection. Massive walls surrounded cities to keep outsiders out and protect them from dangers and threats. Although these massive medieval boundaries are not as common in our modern era, such boundaries can still be found all around us, including on a human scale. It must be noted that boundaries are essential to our safety; not only do they separate different activities within a determined space, but they also give us context on what should be happening within them. For example, in Ancient Rome, although the

walls surrounding the city were shut entirely, they were also inviting and porous. Informal markets gathered around them, houses were built on both sides, and they functioned as places where connections were made. Richard Sennett argued that although such barriers should be sought to exist, they must also be “breachable, if not ambiguous.”⁹ While the boundaries we will measure are not as ominous as these, we will identify the smaller constructed and material edges as they provide separation, if only in the subconscious. Humans tend to look for attributes in the environment that comfort us and protect us from threats. Physical comfort is one of the most critical resources the surrounding environment can provide. Whether you are removing yourself from the harsh heat of the sun or removing yourself from a big crowd in a park, the environment around you must allow you to seek shelter when needed to feel safe. Although seeking refuge when required is essential, Appleton explains, based on the prospect-refuge theory, that we tend to prefer environments or situations that allow us to observe our surroundings while remaining concealed from them.¹⁰ This phenomenon is observed and studied in Lis and Iwankowski’s research. They note that if our visual obstruction is impaired by surrounding elements, such as dense vegetation, our sense of safety decreases due to reduced environmental awareness.¹¹ Although this might seem like a process of exclusion, Altman argues that “privacy is a process whereby a person sometimes wants to be separated and at other times wants to be in contact.”¹² This allows the individual to meet their everchanging needs and shift from one state to another. Therefore, we can conclude that these boundaries and shelters must do two things: protect us from a situation we are trying to remove ourselves from, and allow us the opportunity to observe from a safe distance our surroundings.

Measurables for Spatial Boundaries,

1. Identify the overall boundary of the Place
2. Define smaller boundaries (Constructed, Material, or Shelter) and the type/ constructed technique used to separate the different activities.
3. Examples of Constructed Boundaries: walls, fences, half walls, significant elevations drop in a hardscape etc.
4. Examples of Material Boundaries: pavers, decking, recycled playground flooring etc.
5. Examples of Shelter Boundaries: groups of trees clustered to create canopies, awnings, arcades etc.

Lighting Profile (location)

While witnessing a crime will directly influence our sense of security, our imagination can often get the best of us without firsthand exposure. How our public spaces and streets are illuminated will establish contextual predictability to our surroundings and our willingness to remain there. “Street lighting enhances visibility, contributes to social surveillance,



Figure 2. Step 1 Measuring Place. Pipeline to Better Placemaking.

reduces the fear of crime, and decreases criminal opportunities”¹³. Clark points out that “crime prevention can be sustained, and opportunities of crime can be reduced through modification of the physical environment.”¹⁴ Wilson also states that “improving the environmental quality of the streets through street lighting strengthens community confidence, cohesion, and social control.”¹⁵ Our lighting designs do not necessarily need to flood the surrounding, as this would flatten and remove the visual intrigue of the built environment. A comparison could be found between the lighting design of a Walmart and a boutique store such as Abercrombie and Fitch. Let us balance the extremes by providing rhythmic, architectural, and task lighting to serve the purpose of visual intrigue and security.

Measurables for Lighting Profile,

1. Identify and examine the locations and patterns of lighting fixtures in the existing public space
2. Cross analyze how absence of order or populations correlate to the presence of lighting or lack thereof.
3. Examples of rhythmic light: consecutive and consistent streetlamps that follow a pattern.
4. Examples of task lighting: lighting coming from residential lighting, restaurant setting, - not consistent or rhythmic.
5. Examples of architectural lighting: fixtures dedicated to illuminating the facades of surrounding buildings

Nature Prevalence (vegetated & animal)

Capital improvements to our urban streets and plazas often pay tribute to nature with an insignificant planter of flowers and shrubbery. These subtle additions show how removed we understand nature to be from our mental well-being. “We are used to conceiving of nature as external to society, pristine and pre-human, or else a grand universal...”¹⁶ Swyngedouw would later disclose capitalism as the limiter of the ample exposure to nature in urban contexts. Maintenance cost for such ingredients in our streetscape influences our decisions. Nature providing human therapy, though, is widely discussed.^{17,18} In Attention Restoration Theory, Berman identifies directed attention as the cognitive mechanism restored by interactions with nature. According to Berman, interacting with environments rich in inherently fascinating stimuli (e.g., sunsets) evokes involuntary attention modestly, allowing directed attention mechanisms a chance to replenish. The average occupant of public space might not directly recognize this calming influence. However, most of our observations in this step find occupants residing at or in view of these natural conditions.

Measurables for Nature Prevalence,

1. Identify and examine the moments in nature for our site natural or designed
2. Identify and examine the domesticated and wild animal life within the space

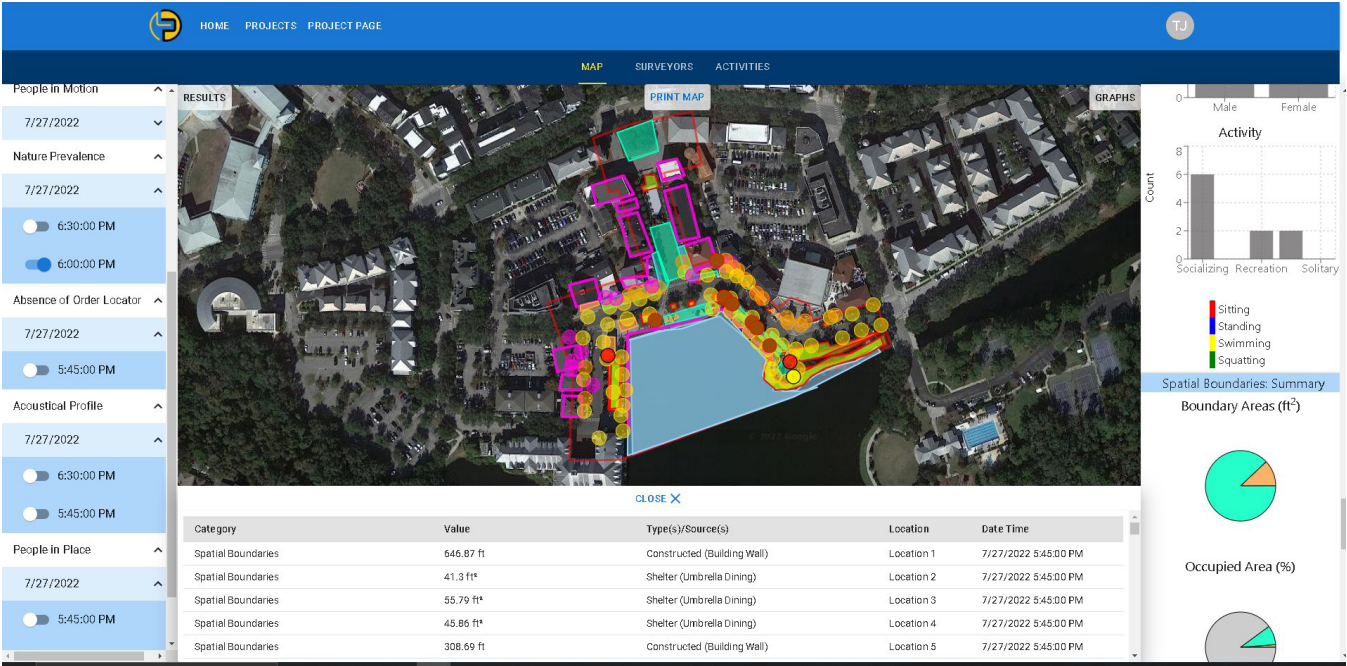


Figure 3. Image caption. Pipeline to Better Placemaking.

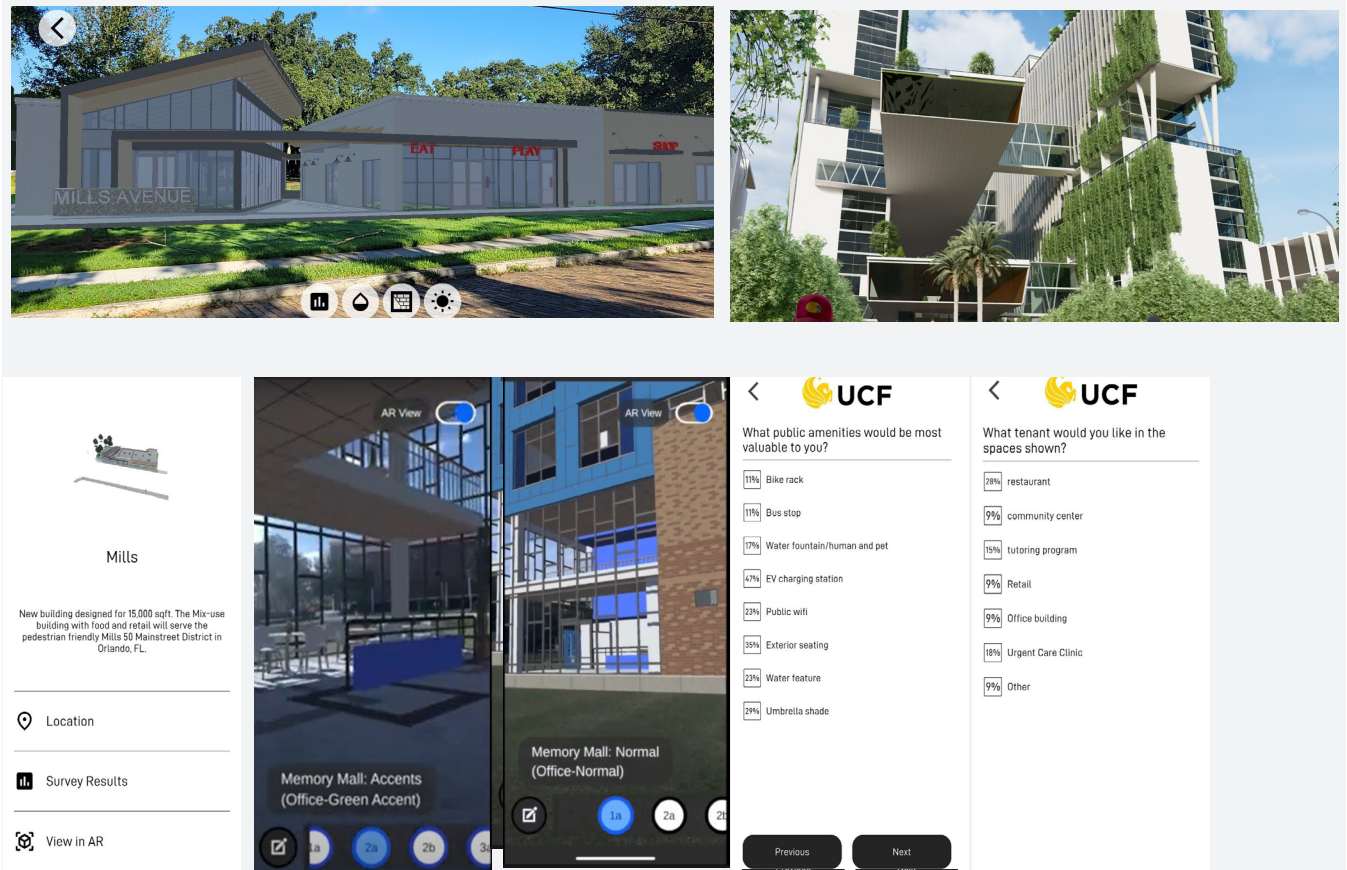


Figure 4 Step 3 Digital Engagement of Place. Pipeline to Better Placemaking.

3. Cross analyze how the presence of nature corresponds to the location of People in Place study as well as other tests.

Absence of Order Locator

The 'broken windows' theory is one of the most extensively studied concepts in policing literature.¹⁹ The broken windows theory can be perceived as a warning about the consequences of public disorder and its deleterious impact on the community. Concepts related to this theory seek to explain why New Orleans experienced high levels of riots and looting in the aftermath of Hurricane Katrina- in such circumstances, the community's behavior was far from unexpected, Ranasinghe explains. Kelling describes this phenomenon in their research and theory of the "broken windows theory,"^{20,29} which explains how disorder might inspire disorderly social behavior that might pose concern for personal and public safety.²¹ Behaviors such as panhandling, public drinking, loitering, and broken storefronts, amongst others; are not only related to crime and violence but also provide an environment where we are in a constant state of awareness and ignite the fear of "being bothered by disorderly people".¹⁹ We will measure both the built environment and human behavior during this test.

Measurables for Absence of Order,

1. Identify and examine the absence of order in human behavior
2. Identify and examine the absence of order and the lack of Maintenance of the built environment
3. Examples of disorder: individuals under the influence, panhandling, untreated landscape, broken elements, etc.

Acoustical Profile (decibels)

Raucous noises can trigger the "fight or flight" response within us and put us in an area of stress.³⁰ Huang notes that in research on noise pollution within neighborhoods in Chicago, when the noise in our built environment reaches a certain level, you cannot respond to or perceive important environmental stimuli, and your attention can be drawn away from critical situations. Constant exposure to loud noises or noise pollution can be considered an environmental stressor and might induce feelings of anxiety, depression, high blood pressure, and heart disease.²² However, the question of noise being perceived as safety also arises. To an extent, noise such as water fountains, diffused conversations, and nature might resemble feelings of comfort and presence, increasing our sense of safety.¹¹ For this part of the research, the loudness of decibels will be analyzed, and the role acoustics play in our security.

Measurables for Absence of Order,

1. Measure the Loudness in decibels in 3-5 locations on the site throughout the day.

2. Identify the collection of sources for the sound level.
3. Identify the single most significant contributor for each reading.
4. Examples of sounds: water fountains, traffic, crowds talking, music, etc.
5. Cross analyze how the levels of sound correspond to the location of the People in Place study and other tests.

STEP 2 DESIGNING PLACE FOR AR ENGAGEMENT:

The academic definition of Augmented Reality refers to three-dimensional, real-time, and interactive display technology that mixes virtual graphics with physical space.²³ The merging of the digital with the material distinguishes augmented reality from virtual reality²⁴ and has recently become an escalating point of interest for academics due to mobile device applications.²⁵ AR's key feature in place-making is its ability to interact with artifacts in physical space that can blend both landscapes into a hybrid space.²⁶ This hybrid space becomes the laboratory through which community members and designers can engage in a real-time dialogue. This conversation begins with initial design concepts derived from analytics and data gathered in Step 1, which inform preliminary design parameters and forms. These assets are generated using Rhino 7, Grasshopper, and are imported into 3ds max for insertion into the Pipeline platform. Before insertion, assets must undergo extensive preparation involving polygon count reduction, limiting texture size, baking textures, and compressing models or generating LOD proxies. Once design options have undergone optimization, they are ready for deployment into the urban space via PBP, which will use spot markers in the public space that position assets accurately in the AR environment.

STEP 3 DIGITAL ENGAGEMENT OF PLACE:

Through community participation, designers can fully understand a neighborhood's unique characteristics. The Pipeline to Better Placemaking (PBP) intends to democratize urban development in ways that have only recently become possible. The application leverages augmented reality to create a more engaging design process, one with zero barriers to entry. Participation will be free of cost and is user-friendly. The Pipeline looks not only to display future concepts for a community but also to pull vital opinions and user data to support the viability of a project better. (See Figure 4)

The community will come only if you create with "them" at the start of conceptualization. Using the community as a collective owner in the design process, both directly and through human behavior observations, leads to a design for a regenerative and redistributive commons-based economy or a Community's Place. "Placemaking is a process that creates the capacity for people to invest in space with meaning."²²

STEP 4 DESIGN INTEGRATION:

During Step 4 of the Pipeline to Better Placemaking, researchers aggregate data collected from eleven-point questionnaires, digital charrettes, and empirical observation of users on the Pipeline AR application to produce a refined version of products developed in Step 2. This process runs concurrently with Step 3, as data is continually collected. While information is gathered, consensus emerges on conditions relating to security, lighting, order, comfort, wayfinding, scale, and acoustics. These conclusions inform the redevelopment of space and place, resulting in an iterative feedback loop of continual refinement. This workflow leverages the expediency of technology to improve the Asset-Based Community Development process. The democratization of the design ends when dramatic deviations become more irregular. At this point, the transition into Step 5 occurs, and the production of market materials begins, which includes revised versions of the AR/VR content.

STEP 5 TURN OVER AND ASSIST IN FUNDRAISING:

The Pipeline to Better Placemaking team turns over the newly refined and community backed design to the city or developer. Opportunities to present the project using AR & VR technologies will further assist in larger venues and town halls during the fundraising process. (See Figure 5)

STEP 6 BUILD IT:

The final stage - We take a step forward with a community project that may have never seen the light of day. These projects will be designed to fill a specific need for their community.

CONCLUSIONS:

While this is just the beginning of our Pipeline to Better Placemaking, we have received tremendous support from local firms and the city of Orlando. We have begun working with the city's 13 Mainstreet districts as well as small projects from local firms to measure existing future sites and garner community feedback on future projects. The future of the Pipeline will grow as a tool for communities in any geographic location. Through the intimate process of listening, it will stand as a tool to create future spaces regardless of language and culture. As both site and sight, meeting Place and social staging ground, public spaces enable us to conceptualize and represent the city-to make an ideology of its receptivity to strangers, tolerance of difference, and opportunities to enter a fully socialized life, both civic and commercial.²⁷ Although the concept of placemaking is not new, the concept has broad implications and remains poorly defined in the literature. Placemaking can take on many forms—architectural, social, and cultural, to list a few. However, amongst the many definitions for placemaking, a central theme remains constant—placemaking is the process of attaching meaning and purpose to a space.²⁸ The Pipeline to Better Placemaking stands to create and enhance places that inherently belong to its community.



Figure 5. Main Street District. Pipeline to Better Placemaking

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