Reading the Landscape

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Abstract. Visual Literacy plays a crucial part in the work of landscape architects. It is utilized as a clarifying lens to research and gather information, analyze and develop graphics, and engage the community and stakeholders. The process involves active visual learning through drawing and creating to deepen the understanding of places one encounters. Through a community trail assessment case study, the paper will show how visual literacy strategies strengthened the design process, the value of the information gathered and the communication of the work. The assessment highlighted the importance of on-the-ground observation and experience to aid in the visual literacy of the landscape. The immersive observation techniques provide a deeper understanding of environmental conditions and character that influence perceptions of the landscape. It also led to the creation of maps and diagrams aimed at expressing the sensory and experiential data gathered through direct engagement with the trail landscape. By visually organizing and representing the qualitative data spatially, the data could then be analyzed in relationship to other spatial information or additional qualitative and quantitative data.

Keywords: landscape, landscape architecture, community engagement, trail, transect

In the field of landscape architecture, visual literacy is an important factor in how people understand and experience the built environment as well as how the landscape architect graphically represents those experiences and conditions. To observe, sense and visually understand the relationship between the character of the landscape and how humans interact with it, one must be on the ground and directly engaged with it. This immersive method pro-vides a deeper understanding of the landscape and allows for a more experiential assessment of the built environment. The assessment --- a form of visual communication --- when reflective of this method of investigation, aids in creating experiential and spatial graphics integral to revealing patterns in the landscape.

The paper focuses on how the role of landscape architects benefits from the use of visual literacy strategies within their projects and how bringing those techniques into the community engagement process strengthens the role the community plays in the design project. The authors will demonstrate this process through highlighting key steps of a community-wide trail assessment project in Ames, Iowa, a small city located in the midwestern United States. This case study will showcase the benefits of the visual literacy strategies utilized in the project.

Visual Literacy in Relation to Landscape Architecture

Landscape architecture is a visually based design field. Visual literacy is not yet a common topic in the field but landscape architects do employ a variety of visual methods and understand the importance of visual imagery in the process of site analysis (Balmori, 2014; Sanoff, 1991), develop critical landscape research (Dee, 2004; Southworth, 2006) and strengthen communication (Balmori, 2014; Al-Kodmany, 1999). At the very basic level, landscape architects utilize visual

techniques of observation and analysis to understand the sites they are working with and visual representation tools to communicate their work. The work of the landscape architect often involves not only observing and asking questions regarding the images and visual experience, but actively creating and diagramming from and upon these visual inputs as an act of exploration, to generate new ideas, see the landscape in new ways and make discoveries (Dee, 2004; Balmori, 2014). This active approach of creating new knowledge through new experiences and design iteration is reflective of the visual literacy and learning. (Felten, 2008; Introduction, 2017). This active and interactive approach to visual learning combines how to communicate what we perceive and interpret what we see. Visual literacy extends to the entire visual world, which includes the built and natural environment (Romice, 2000). The landscape architect reads the landscape, similar to how one reads an image, by taking in the surroundings, assessing it and making judgments about it. Landscape architects employ visual methods as tools for observation and analysis, to strengthen communication and bridge boundaries between experts and the public.

Landscapes are dynamic, spatial and evolving. They are composed of natural, built and cultural environments, which humans manipulate to suit their needs (Kaymaz, 2012). To begin to understand these complex places, landscape architects look at the world as a series of interconnected scales. Assessment of aerial imagery, maps and diagrams showcase large-scale patterns and flow while on-the-ground information gathering reveals experience and connection to place. The multiple layers of information within each scale are evaluated simultaneously to define the experience and character of the space. Understanding these layers of experience and how they relate spatially and programmatically to each other, is key to designing places that create positive experiences. The authors believe this process is more effective when engaged in active, visual methods of gathering and assessing information and communicating it. This is important in promoting collaborative and inclusive design processes and making the information accessible to the public, city planners and other interested parties. Visual literacy is more successful when seen as a common, usable system for all people and not just the trained experts in design, to learn, create and analyze through imagery (Dondis,1974).

Strong visual literacy skills aid in the ability to communicate our experiences in environments we encounter every day, just as they do in our ability to describe and analyze images (Herman, 2016). Experiencing the landscape in a physically engaged way is similar to connecting holistically and emotionally with images *(*Avgerinou & Pettersson, 2011). Investigating and assessing the landscape requires asking thoughtful and engaged questions about the visual experience of a place. These questions lead to deeper understandings and discoveries about how one perceives and analyzes what they see. The questions that one may ask of the landscape are not dissimilar from the questions one might use in reviewing paintings: What is going on in the scene around you? Why is it intriguing to you? How does it shape your experience? (Yenawine, 2013). Additional analysis may investigate the intent of the designer, planner, or property owner just as one may analyze the intent of the artist.

Through their role as landscape architects, the authors of this chapter, utilize a visually driven research method where the process of investigation and creation become a catalyst for discovery. Utilizing imagery as the basis for investigative thinking and communicating shapes a more critical visual study (Dee, 2004). It also provides the ability to see the big picture, the relationships between the parts and the patterns they create (Introduction, 2017). Infusing the design process with visual thinking and theory, improves the understanding of landscapes, the experience of them and their resulting design (Dee, 2004).

Study of Visual Preferences and Landscape Theories

It is impossible to view the landscape without bias. Peoples' past experiences, culture, judgment, time, the purpose of the visit and inherent biology affect what they see, how they perceive it and

their attachment to place (Romice, 2000; Kaymaz, 2012). Often one sees in the landscape, what they are directed to see or expect to see (Avgerinou, 2011). Vision perceives in conjunction with other senses in a more subject centered way (Kaymaz, 2012). As a result, viewing and asking questions about the places one encounters tends to focus on the landscape qualities and feelings related to plea-sure and safety of the surrounding environment.

Research on landscape preferences provides many theories about human inclination toward a particular landscape type and the qualities that encourage and support the use of it. The primary focus of this project focused on the importance of positive visual qualities and the ability to visually understand landscape conditions that inform perceptions of safety and security to create more walkable and bikeable environments. The landscape preference research highlighted the importance of natural spaces and the presence of vegetation in making landscapes more welcoming and utilized (Kaymaz, 2012). It uncovered historical and biological preferences related to the intrinsic need for safety, security and visual legibility of the landscape based on thinking of our environments as a habitat. This theory, coined *prospect refuge*, by Jay Appleton focuses on responses to the natural environment, but those same needs and perceptions carry over into our understanding and perception of the built environment (Kaymaz, 2102). People are more likely to feel comfortable and utilize environments that are well organized and quickly, visually understood, as well as those that promise a sense of exploration (Kaplan, Kaplan & Ryan 1998). Additionally, preferences are influenced by whether a landscape is perceived as useful or supportive, and provides moderate uniqueness and visual diversity (Kaplan et al., 1998; Kaymaz, 2012).

As one visually gathers information in the landscape they are taking in many components which go in to creating the whole of the landscape environment. The act of seeing is a process that involves taking in multiple dimensions of information simultaneously (Dondis, 1974). As we view the scene before us we may read it as a two-dimensional image the way we see an artwork. This provides the viewer the ability to immediately assess the site in terms of its coherence and complexity. The legibility of the site (the ability to understand and traverse a site) comes through experience and movement over time. When people visually experience and respond to a landscape as a scene, they do not individually assess each part as independent, but rather, take in the whole and give value to that as a sum of its parts (Kaymaz, 2012).

Case Study: Engaging Ames in Complete Streets

The following case study presents a community-wide trail assessment project carried out during 2014 and 2015 the authors collaborated on, titled *Engaging Ames in Complete Streets*. The study was a partnership with the non-profit coalition Healthiest Ames and funded by a Wellmark Foundation Match Grant. The role of the landscape architects, which included the authors and four undergraduate students pursuing degrees in landscape architecture, was to lead the charge of investigating the design and condition of the built environment and its impact on community health. Designing for a healthy community goes beyond a physical health focus and considers environmental, social, economic and cultural factors as well as infrastructure and the built environment.

Ames is a university town in the heart of Iowa. About 65,000 people reside in Ames, with the student body making up nearly half of the population. Ames was settled at the confluence of Squaw Creek and the Skunk River. These two waterways and their adjacent greenways still define the regional character of the town. Squaw Creek cuts right through what is now the center of the town, dividing the downtown and major commercial areas from the west side of town, which is dominated by the university. Trails align and intersect with these river corridors, and although some greenways are utilized for commuting, their purpose has typically been seen as places to recreate, set apart from the urban fabric rather than integrated, as an active component of the overall transportation network. Over time, Ames has grown and developed a coarser land use

pattern, which reduces walkability and bike-ability and peoples' connection with their environment.

The goal of the trail assessment was two-fold: 1), to develop a metrics to assess the experience and character of each trail segment based on defined assessment categories, and 2), to analyze the overall trail network in response to how it supports and encourages active transportation. The community trail assessment provided a framework for developing strategies for enhanced community connectivity and a multi-modal transportation policy focused on context-sensitivity and user experience. By establishing a framework for visually assessing and analyzing the trail networks and pedestrian environments, locations for where and how these networks can be improved to support and encourage active transportation in Ames, is highlighted.

The investigative process, assessment and subsequent presentation of the project brought to light many limitations of standard mapping practices and visual tools, including concerns about the current way that these trails were being visually presented and the need to explore the experiential data in visual form. The limitations of information gathered revealed that a more engaged assessment was needed to understand the landscape. The project presented the team with unique opportunities to improve visual literacy of landscape conditions and experience through graphic communication and community participation, as well as show-case how visual literacy is increased through physical engagement with the landscape.

The case study involved a variety of visual methods, which when used together, strengthened the project by providing a more holistic view of the experience of the landscape. The processes and methods utilized include five primary steps:

1. visual inquiry of existing maps and images through active mapping and diagraming;
2. interactive community engagement to gain local knowledge;
3. sensory walks and an on-the ground immersive approach;
4. visual brainstorming; and
5. visual communication through the development of a transect.

These five steps illustrate how visual literacy strategies improve observation skills, open the door to new discoveries and create more effective means of communicating and collaborating in the design process.

Step 1: Visual Inquiry of Existing Maps and Images

Often landscape architects start a project by looking down from 40,000 feet to see the general make up of a site and its context. They explore maps and diagrams that provide information about the conditions or content of a space. Then landscape architects immerse themselves in a site to visually and experientially take in the details. This is where visual representation and real life experience can often provide very different stories. Though this step is defined by observation it actually involves actively drawing based on what is seen in the images being analyzed. The act of creating images enhances the sensory experience and more directly connects to the physicality of being in the landscape (Dee, 2004).

To begin the trail study the most obvious resource was the town's trail map (See Figure `1). However, after just a few minutes of observation, it was clear that the lines on the map didn't relate to the experience of the landscape or the team's awareness of the existence of these trails. In fact that map would lead an outsider to believe that Ames has a very robust and connected trail network. Though lines appeared on the map indicating the location of trails, it proved difficult to find the presence of many of the identified trails or the conditions necessary to create an awareness of the trails in the landscape. Very little visual or experiential information existed in the landscape to distinguish the represented trails from any other street or sidewalk within the community.

This lack of connection between the visual representation of trails and the actual experience of them in the landscape stressed the importance of engaging with local citizens to find out if they used the town's trails, where they used them, and for what purpose. It also highlighted the need for a thorough on-the-ground investigation, due to the limited data that could be gathered through visual imagery and mapping.

Step 2: Active Participation by Community

To create successful and livable communities for people, their perceptions, concerns and goals need to be valued and investigated (Kaymaz, 2012; Al-Kodmany, 1999). Those who will be utilizing the spaces and places are more deeply tied to them through their experience, culture and history. Bringing community members into the design process of a project more thoroughly informs the designer through local knowledge, as well as increases community awareness of needs and goals (Romice, 2000), their enthusiasm for the project, and can greatly embolden the design (Al-Kodmany, 1999). Community members can be brought into a variety of points throughout the design process. They may help by providing, gathering or examining information during the inventory and analysis phase. It is also becoming more common to do design chartettes where the com-munity has the opportunity to help shape the design and conceive of the strategies and vision. The use of visual tools (imagery and models) plays a key role in making the design process more interactive and provides a better understanding of the project for community members and stakeholders. Throughout the trail assessment process, there were multiple events and techniques employed for engagement with the stakeholder group, town officials and com-munity members to gather input and feedback.

The community engagement process involved many one-on-one and small group conversations about trail use, concerns, needs and potential routes. These intimate conversations encouraged greater participation and allowed more people to have a voice at the table. The greatest boost to the process however, came through the use of maps (see Figure 1), imagery and encouraging community members to actively draw and diagram their routes, concerns and stories. Over forty community members, both men and women, ranging in age from teenagers to the elderly, provided information about their biking and walking habits through mapping and diagramming with the team. This visual method enhanced conversations and understanding, building stronger communication both ways. The maps were used at three community events: 1) a public open house for the city to gather input for its long-range transportation plan, 2) a community wide Eco-Fair and 3) and a community open streets event sponsored by Healthiest Ames. By presenting and gathering input at a variety of events, the team had the potential to reach a larger and more diverse audience with the maps and diagrams.

Design language and some methods for participation can be hard for a layperson to relate to and leave them feeling disenfranchised in the process (Kaplan et al., 1998). This can happen due to lack of communication tools that allow for greater immediacy and interaction (Al-Kodmany, 1999). Utilizing visual imagery, such as maps and diagrams as a basis for conversation and allowing others to communicate through drawing and diagramming, offers a more direct and common language for dialog (Avgerinou & Pettersson, 2011). People involved in the process have important knowledge related to their history, culture and daily experiences. The designer can use visual literacy techniques to bring out those details through the design process (Al-Kodmany, 1999). Direct involvement by community members in the process of creating maps, diagrams and images increases visual literacy learning and establishes more significant connections with the public.
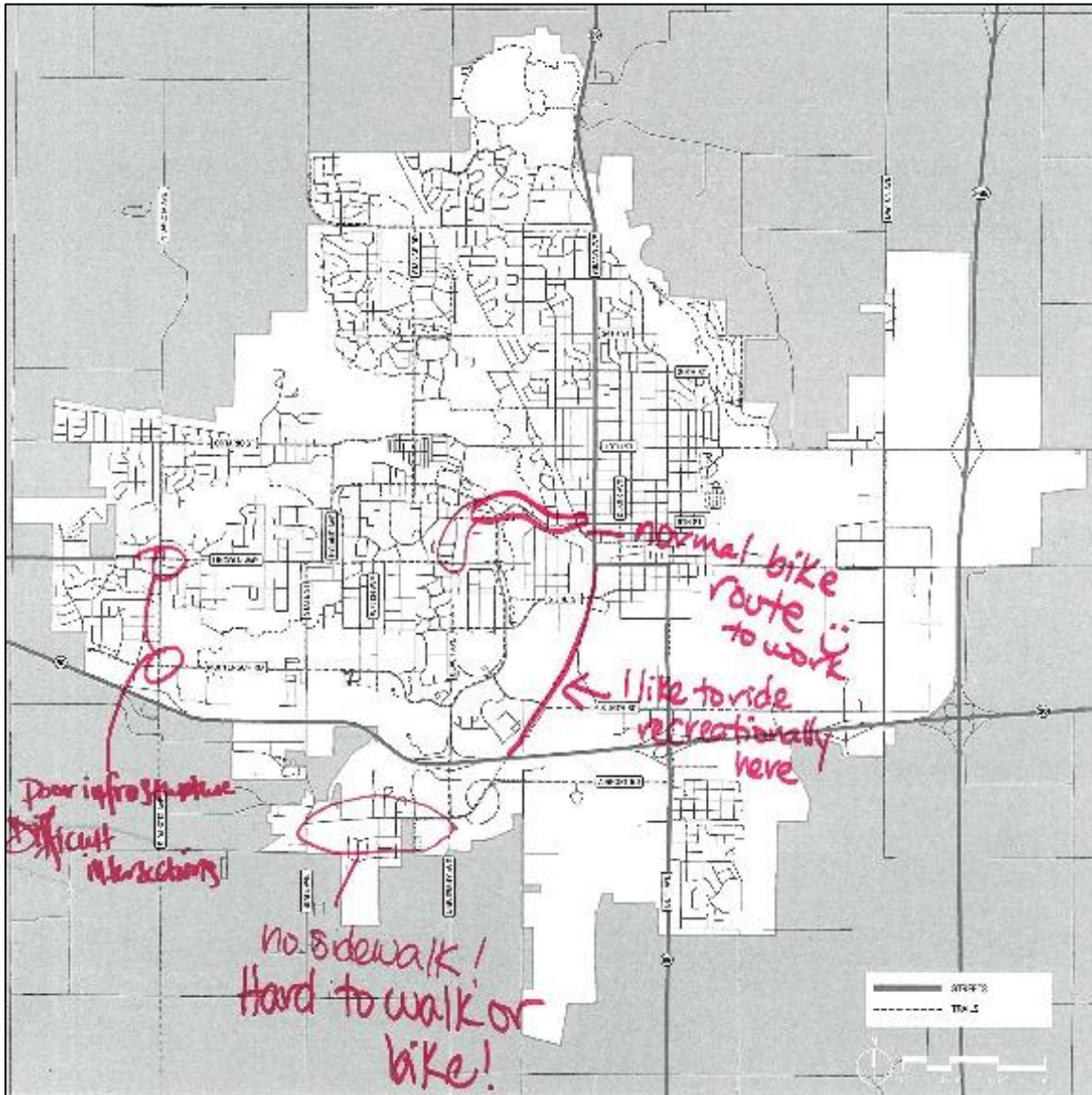
Figure 1. Community Participation Map example. (2015)

Step 3: Sensory walk and immersive exploration

As valuable as local knowledge is, it is best when it compliments data gathered by a trained eye. Environments that people experience on a daily basis, become routine and common that one may overlook obvious information or tune out features that may in fact aid in the ability to navigate through them. To increase visual literacy with regards to the landscape requires becoming ardent observers, asking important questions, learning to recognize new opportunities and solutions, and being open to unexpected discoveries (Herman, 2016). Being open to discovery is an integral part of the design process and key to how this project developed. It is important to engage in design with a sense of uncertainty to allow the design thinking process to reveal or discover new ideas through collaboration and discourse (Pallasmaa, 2009).

As the team began to take a deeper look at site conditions and community awareness of trails, they limited criteria and expectations and utilized sensory walks and immersive visual observation as the primary method for information gathering and directing the inquiry. Sensory walks and immersive exploration involve moving slowly through an environment, with a greater awareness of one's surroundings, sensory experiences and perceptions of the landscape. The physical engagement of walking the trails and being immersed in the environment allows one to perceive the environment with their whole selves and provides time to absorb details, increasing the effectiveness of what is learned (Avgerinou & Pettersson, 2011). The interaction between the human and the visual input is key, both physically and psychologically, toward strengthening visual literacy (Dondis, 1974).

Though much can be learned from images and maps, they cannot provide a sense of the social or natural life of a place (Southworth, 2006). They can overlook the importance of the power of experience and the power of place and can often be biased in what they show (Dee). Being in the space may have its challenges, including factors such as climate and phenomenology, which may affect judgment, but a landscape is dynamic and needs to be experienced first-hand (Kaymaz, 2012).

Based on community input, research on walkability and landscape preferences as well as the team's experiences in the landscape, a set of introductory questions for the sensory walks and immersive observation was established, such as, "Does this space feel safe, inviting, connected, maintained, utilized? And what are the visual indicators that may be influencing that perception?" (Southworth, 2006; Kaplan et al., 1998). These methods helped direct the inquiry and analysis, leading to the development of specific elements that connect perceptions of the landscape to physical objects or conditions visible in the environment, such as, lighting, people, signs of maintenance or lack of it, signage and safety accommodations, fences and other barriers. These questions and visual observations helped uncover the relation be-tween how well the landscape is being cared for and peoples' feeling of safety and connection to their surroundings. The initial questions and the indicators evolved as we began taking in new information as active participants in the landscape.

Step 4: A Visual Guide for Exploration and Assessment

The questions that developed through the sensory walks and walkability research aided in estab-lishing six key criteria for future, on-the-ground trail assessments: trail signage and delineation, lighting, safety features, connection to the surrounding environment, quality of the adjacent landscape, and surface quality. Every community is unique, so there is no single prescription for walkability, but there are general guidelines that help direct success (Southworth, 2006). Some of the conditions and qualities that go into creating walkable communities are physically experienced, but many factors relate to how people visually interpret and perceive their environment.

A place-based metrics was created to establish a hierarchy of information to be observed for each of the six criteria (see Figure 2). Together these established a visual language for discussing and questioning what the team saw in the landscape. The goal of the metrics was to assess the trail network based on the scale of the community, and the character and conditions that one could expect to see within the community. This aided in fine tuning the trail assessment according to the context where it exists, and provided the team with a more appropriate level of expectations for examples of both positive trail environments and areas of concern. The metrics explores subjective perceptions of the trail and surrounding environment while gathering the data through a more objective lens.

Figure 2. Assessment Metrics. The example shows the range of conditions analyzed through the trail for two of the categories. (2016)

Work that was being carried out by others, for Ames' long-range transportation plan, was also looking at road, sidewalk and trail conditions. The work in their plan however, focused on content like, *level of service* (LOS), which considers the capacity of the route to manage the anticipated use and *demand analysis*, which looks at areas more likely to need cyclist and pedestrian infrastructure. Some information was being gathered from community members related to their concerns and goals, but overall the information being collected was not considering the experiential and visual conditions that determine a routes use or success (HDR, 2015). The Engaging Ames in Complete Streets trail analysis was intended then to compliment the long-range transportation plan and be a tool to identify very specific locations and conditions for future design strategies and updates. To do this a metrics with a wide variable range of assessment was necessary so that minor deviations within the data could be more easily seen and provide a clearer picture of what details and conditions were really affecting the routes success or struggles. The criteria were evaluated on a seven-category scale from "none," where elements or connections are not present to "excellent," where the conditions exceeded expectations that were assumed to be present in the community. A detailed description (see Figure 2) about the condition and list of anticipated components for each category on the scale was developed so that the process could be picked up and used by others for further assessments.

Step 5: Visualization of Analysis

Visualization of the assessment needed to express the multiple layers of experience and conditions gathered through walking the trails, relate them spatially to one another and in doing so represent a larger story about the character of the trail network. When one sees, they are engaging a composite of multiple parts that work together to form the whole of the image, the significance of which is determined by the importance of the weight of its parts (Dondis, 1974). In this way one begins to construct an analysis of the landscape, attempting to visually express how each moment along the trail is   defined by the strengths of all of the individual pieces working together.

A primary goal of the assessment was to create a transferable method that could be utilized by others in various settings and communities. Because of this, it was important that the visualization techniques be adaptable to new locations and be easily understood by the general public. A variety of methods, both written and visual, were tested as a means to showcase the team's data. The written data, expressed in lists and tables was too cumbersome and could not convey the experience or the spatial qualities as well as imagery. Charts and graphs were able to summarize and compare the experiential data, but the spatial qualities were missing. Though maps worked well for conveying space, there was not a way to then express the experiential qualities clearly on the map plane. In the end, the *transect* (see Figure 3) proved to be the best suited method to express spatially the many layers of experiential data and be visually accessible and transferable. Transects are a method typically utilized by biologists and environmentalists to map, describe and locate land-scape resources and the presence of plant and animal species. By gathering samples at given intervals along a determined route, the re-searcher can understand a larger context, relate various levels of information spatially and identify opportunities and barriers (Transect analysis, 2002-2017). Diagrams including transects are often more easily understood by the general community especially if they use content and symbols that are meaningful to the particular community, as compared to professionally drawn plans and other design drawing tools such as sections (Transect analysis, 2002-2017).The transect presents simultaneously two-dimensional evaluative planning strategies with three-dimensional experiential and spatial goals in order to give a better sense of the whole (Talen, 2002).

Design can be complex and reveal new information that goes even beyond the process that created it (Tufte, 1990). As in the assessment, the development of the graphic communication was a process of visual brainstorming. Because the team set out with uncertainty about the outcome of the analysis and the visual presentation of it, new ideas were able to be explored and new relationships discovered. The layering process that created the transects for this project brought forth relationships that highlighted how the trails were performing, located key points where intervention is needed as well as key points that could serve as precedent examples for trail updates. Common factors in both the routes chosen and areas of concern presented by the community members during the input sessions, were highlighted in the highs and lows of the transect layers.

The assessment revealed the strength of the greenway which lines the river and creek corridors flowing through town as successful examples of trail development and showed the potential strengths of extending those routes to connect to other major points in the city. Locations where there was greater visual awareness of the trails, both for the cyclists and drivers, and where the surrounding environment was well maintained also scored high on the transect, which highlights the power of visual experience in creating positive environments. The conditions and qualities found in the exemplar trail segments were suggested as precedents for how to improve upon less successful trails and develop proposed trails. Since the time of the study many updates have been made through-out the city to its trails and bike infrastructure. One of the key changes has been the introduction of trail route signage and road markings to increase awareness of the routes. These signs and markings encourage use because cyclists and pedestrians are made

visually aware that they are on a designated route, which helps with wayfinding and implies a level of expectation related to condition. These updates also bring greater awareness to drivers that they can expect to encounter cyclists and pedestrians on and along these roads and that they should proceed with greater caution.

Figure 3. Transect example. This image highlights the intersection at State Street with the Middle School Trail, noting the safety features and pedestrian infrastructure in place at this location along the route. (2016)

The transect also revealed ways in which the data and the method could connect to other spatial research within the community. The transect's ability to link a variety of spatial data encourages the connection of research from multiple disciplines to merge their thinking and develop richer understandings of place through this common visual method for gathering and relaying data (Talen, 2002).

Transects can also be a community based method for gathering spatial information, allowing members of the community to have an active role in the inventory and assessment of the landscape and provide descriptive recordings of on-the-ground information. The leaders of the walks, the designers and planners, become active listeners in the process of identifying problems and potential solutions (Panek, 2015). One shortcoming of the transect is that it only captures a single moment in time. Pairing the transect with local knowledge and experience of community members gains a better understanding of real life conditions (Transect analysis, 2002-2017).

Summary

Visual Literacy plays a crucial part in the work of landscape architects, from the way that they research and gather information, analyze and develop graphics, and how they engage the community and stakeholders. The community trail assessment project for Ames sharpened skills in assessing existing maps and imagery and comparing it with real perceptions of the landscape. The five steps involved in the project, visual inquiry, active participation, immersive exploration, visual assessment and visual analysis, all combine together as visual literacy strategies that landscape architects can use to engage communities in the design process. The strategies increased community participation in the project by using different visual communication tools that engaged in more personalized conversations through drawing. A better perspective about the landscape was gained during the on-the-ground assessment. Through physical and visual immersion in the environment, a more realistic impression of the character and conditions present, was revealed. Entering the study with limited questions and expectations, minimized bias and opened up the project to visual discovery. The immersive walks provided the framework and visual language for documenting the conditions of the trail and increased awareness of the landscape qualities that influence perceptions of safety, security, convenience and other mobility factors.

The transect method helps to visually construct, analyze and communicate spatial and multi-layered data, gathered by the team, and merge it with both two-dimensional planning strategies and three-dimensional experiential conditions. As a result, the transects provide a more accessible visual communication tool that can become a model for future assessments. The transect is a critical visual study of the big picture by showing individual parts in relation to the whole and the patterns that are generated at different scales. The benefit of the transect method employed through this project has allowed the data to be a major component of the larger data set and provides new opportunities to better visually present, more accurately and experientially, the landscape. Finally, the visual analysis can become a future tool for other landscape architects and communities to use and make new discoveries of their own.

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