Valley Metro urban shade best practices

After 3 semesters working with Valley Metro, this semester's GreenLight team created two memos that served two different, but similar purposes: to identify which existing light rail stops were in most need of shade retrofitting, and to re-inform Valley Metro of its urban design best practices regarding shade for future light rail projects.

GreenLight GreenPaper

Fall 2020

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Challenges & Opportunities	Our Project Partner is facing the significant challenge of extreme heat in the Phoenix Valley. Valley Metro understands the burden that Phoenix's heat places on its riders, most of whom (70-80%) walk to their transit stations daily. This challenge posed the opportunity for Valley Metro to improve it's transit stops for its riders by increasing shade at its most vulnerable stations, and thinking ahead to new light rail stations that will be built in the coming years.
Recommended Solutions	The Fall 2020 GreenLight team built off of past semesters' work, where the team took ambient temperatures surrounding and atop 10 light rail stations that were identified by the Project Partner as most vulnerable. From there, the team ranked temperature data, station direction, city, and other factors such as available land space to determine which four vulnerable stations needed retrofitting most. This information was imputed in our first memo and was sent to our Project Partner, Mackenzie McGuffie. Findings included: • Stations oriented N/S have the lowest shade coverage throughout the day and especially at peak travel times. • The amount of shade a station received has more of an impact on thermal comfort than the color of pavements or the materials used. Our partner sent out this information and recommended stations to Valley Metro. After this our project partner worked with the Valley Metro design team to create a design for one of the recommended stations, Central Avenue and Camelback, and reapplied for the Healthy Urban Environments (HUE) grant. Our second memo posed more solutions surrounding best shade practices. Offering a more in-depth analysis into Valley Metro's current urban practices guidelines, the Valley Metro GreenLight team noted important shade features that could be utilized within Valley Metro's Cap-10 light rail extension and future Transportation 2050 light rail expansions. This memo discussed common 'do's and don'ts' for urban forestry, station orientation, art installations, and technology with regard to shading. These do's and don'ts utilized case studies from different stations globally to discuss what could work in the Phoenix Metro area. The goal was to reintroduce old and new information that would keep shade in mind for new light rail endeavors.

Project Benefits

Benefits to Project Partner

Our Project Partner benefitted through the creation of the two memos that would help inform the entire Valley Metro team of the importance of urban shade and its effect on the Urban Heat Island (UHI) effect and on resident mobility and safety. Our first memo gave the Valley Metro team a second formal opinion on the necessity for current station retrofits, along with highlighting low-cost ways to improve shade and ambient temperatures.

Benefits to Solutioneers

The Solutioneers benefited from our partnership with Valley Metro in many ways. Interpreting and analyzing data, and then making recommendations based on available information and outside factors improved our logical reasoning and decision making as a team. In addition to this, Valley Metro's first memo had strict time constraints, which was an invaluable lesson in time management. Lastly, the nature of this project was a benefit; having a say in tangible change motivated us and proved that small changes can create a large impact.

Benefits to the Community

The GreenLight Valley Metro team feels that accessible public transportation is a necessity for all people. More shade at light rail stations sets a precedent that Valley Metro and GreenLight Solutions will not stand idly by in the face of climate change, where low income communities will be affected most harshly. Increased shade decreases temperatures and reduces the UHI effect, which brings a benefit to the entirety of the Phoenix community. If one citizen benefits from increased shade through the work that was completed this past semester, we have done our job.