



A STOP WORTH WAITING FOR

Transit in Service of the Public Good

Photo Credit: Chad M. Davis, AIA



“BUS STOPS OFFER A CHANCE TO IMPROVE URBAN LIVING - THEY DISPROPORTIONATELY SERVE LOW-INCOME COMMUNITIES AND COMMUNITIES OF COLOR, AND OFFER FLEXIBLE, COST-EFFECTIVE OPPORTUNITIES FOR AGENCIES TO MEET THE NEEDS OF THEIR RIDERS.”

Project for Public Spaces

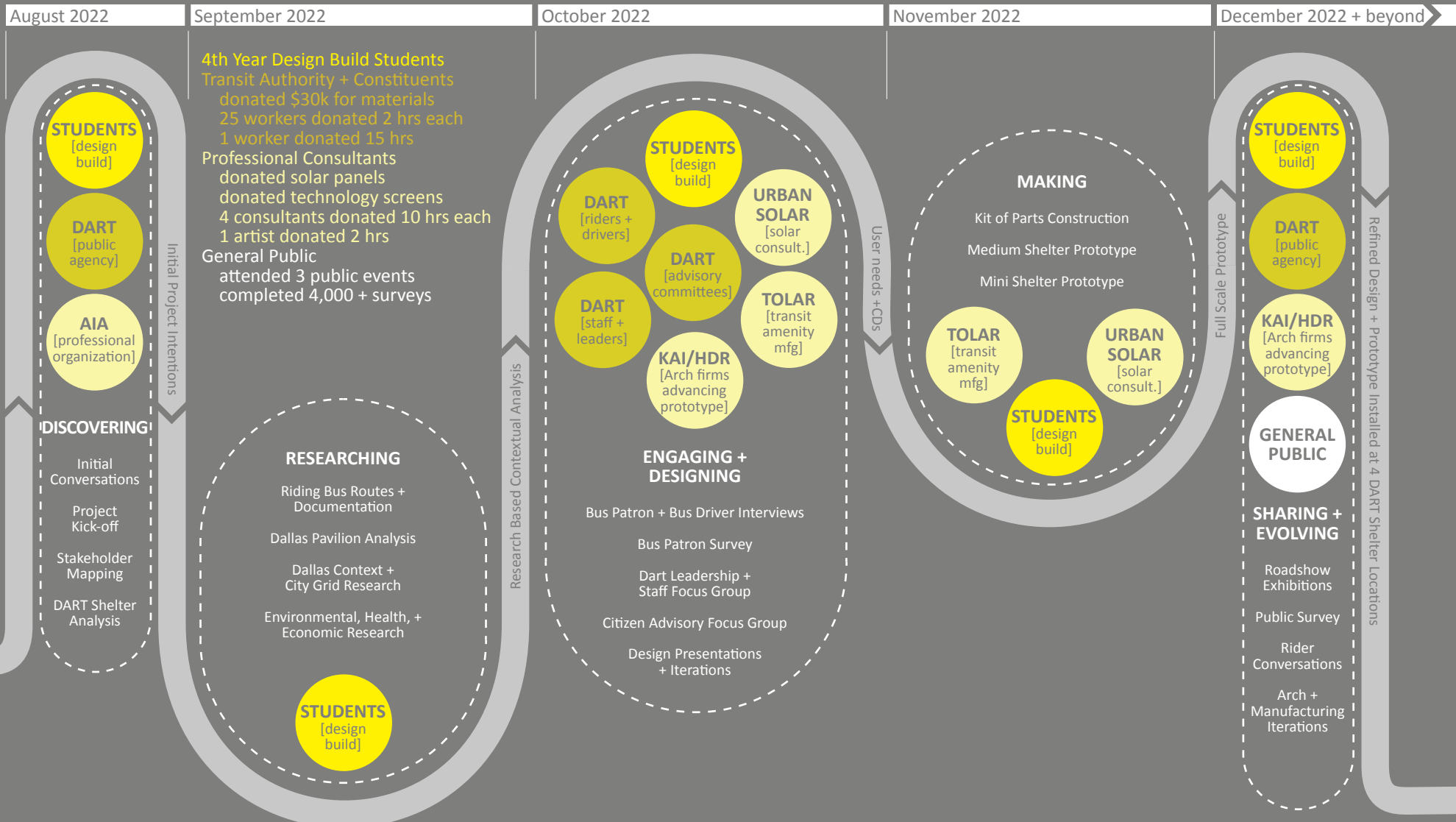
BUS STOPS AS PUBLIC AMENITY

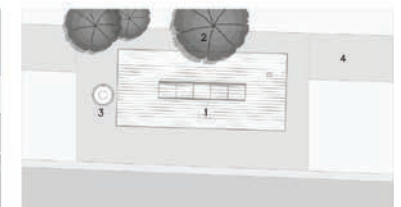
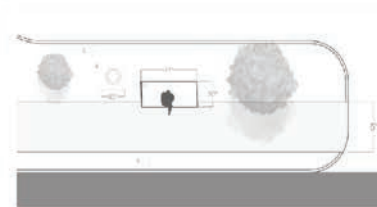
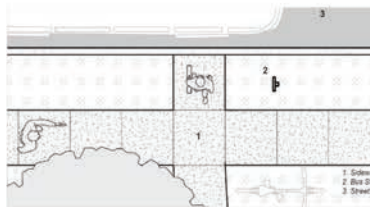
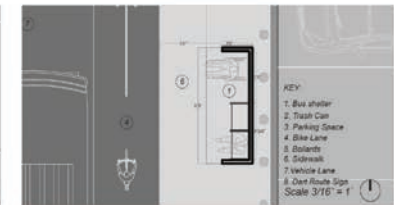
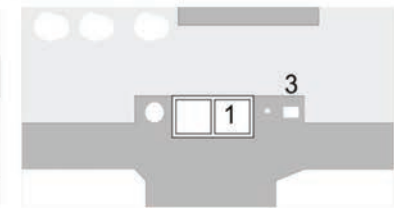
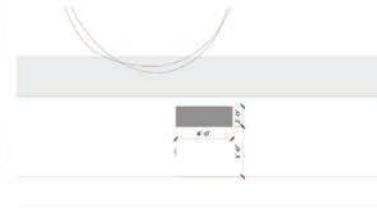
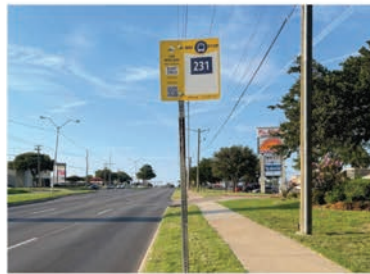
“A Stop Worth Waiting For” partners university architecture students with the regional transit authority, Dallas Area Rapid Transit (DART), and AIA Dallas to design and build a next-generation bus shelter prototype. DART services 13 cities through 6,800 bus stops that accommodate over 20 million riders annually. Under its network plan, 74% of all residents live within a 10-minute walk of a bus stop, far greater than those who reside near a public park or community center. Bus stops are thus uniquely positioned to expand social, environmental, and economic infrastructure to areas of our cities currently under served by public amenities. This project re-imagines the design of existing infrastructure to optimize public benefit. By coupling research with public engagement and design with making, the new shelter enhances rider experience, responds to environmental conditions, and celebrates unique neighborhood contexts through its kit of parts approach and tailored use of art and technology.

Photo Credit: Chad M. Davis, AIA

PROCESS + PARTNERSHIPS

This community-based project highlights the potential of a collaborative process, integrating cross disciplinary expertise including education, architecture, manufacturing, municipal agencies, and residents to re-orient municipal practice to value design in public infrastructure projects. This project was completed as part of a one-semester 5-credit architectural studio comprised of fourteen fourth-year undergraduate architecture students. Course pedagogy challenged students to apply innovative research, critical advocacy, design, making, and evaluation to produce a more equitable bus shelter.





DISCOVERING

Beginning with observational analysis, students were provided a DART regional pass and rode, documented, and analyzed the bus transportation network and amenities across the Dallas Metroplex fist-hand. Grid patterns, environmental conditions, and discrepancies in infrastructure and facility maintenance between neighborhoods of different income levels influenced student’s initial perceptions and questions.



"The concrete benches are too HOT to sit on during the summer."

DART Rider



"There should be a shelter at every bus stop to make the HEAT tolerable."

DART Rider



"I've seen bus drivers pass riders waiting at stops many times; there needs to be a better system."

DART Citizen Advisor



"I'd rather sit outside the shelter than in it because it feels SAFER."

DART Rider



"We need more staff for cleanliness and trash pick up. Neighbors complain about trash overflowing."

DART Employee

ENGAGING

In addition to first-hand experience, students leveraged direct public engagement via (3) focus groups, (20+) interviews, (10+) site walks, and (4000+) surveys to inform the design and construction of a shelter that enhances rider experience. The built prototype was developed with input from DART bus riders, citizen advisors, bus drivers, DART leadership, and local artists. Community input on existing and new designs generated the following research questions that sought to re-frame shelters as more than just a place to wait for the bus.

RESEARCHING

“THE PRESENCE OF TREES AROUND A BUS STOP TENDS TO MAKE A 10-MINUTE WAIT FEEL CLOSER TO 7 MINUTES AND CAN REDUCE TEMPERATURES BY 2-9 DEGREES.”

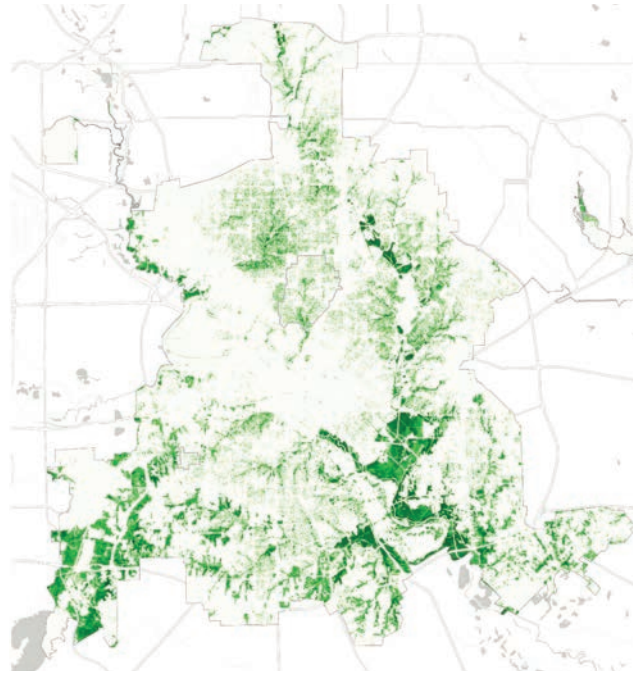
Mobility and Trends, 2015

what if...

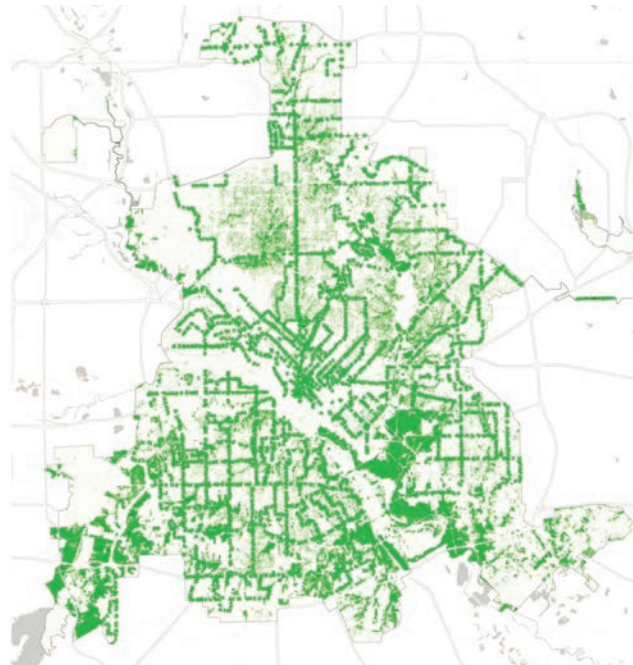
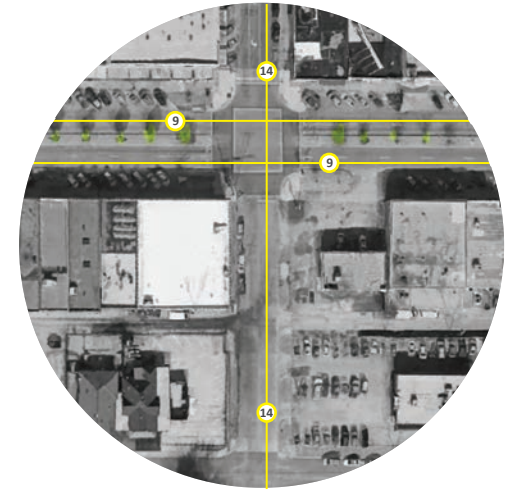
1 TREE WAS PLANTED AT EVERY STOP?

According to the 2019 State of the Air report, Dallas-Fort Worth is one of the most-polluted metropolitan areas in the U.S. About 67% of nitrogen oxide emissions derives from transportation and 38% comes from mobile vehicles in North Texas. More than 2.6 million people have high risk with asthma, lung disease or lung cancer, heart disease and diabetes due to poor air quality. In 2022, DFW experienced 47 100-degree days, becoming the fourth hottest summer on record.

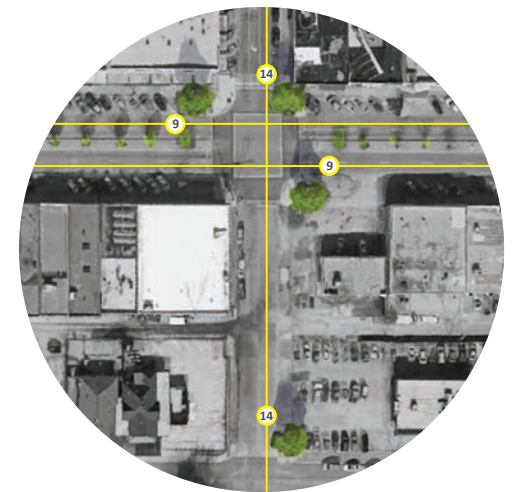
Design Strategy: Partner with local organizations like The Texas Trees Foundation, to plant 1 tree at every DART bus stop. The additional 6,878 trees across the Dallas Metroplex will green existing impervious areas and will help reduce the urban heat island effect. Collectively these trees will absorb more than 330,144 pounds of carbon dioxide from the atmosphere annually, with each large tree providing a day's supply of oxygen for up to four people.



DALLAS TREE CANOPY BEFORE



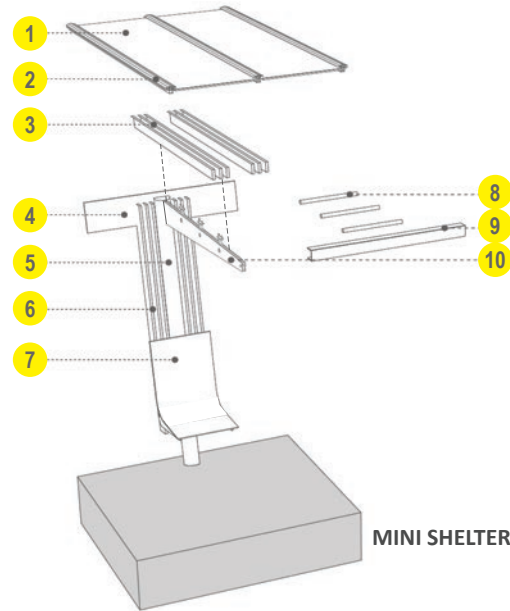
DALLAS TREE CANOPY AFTER



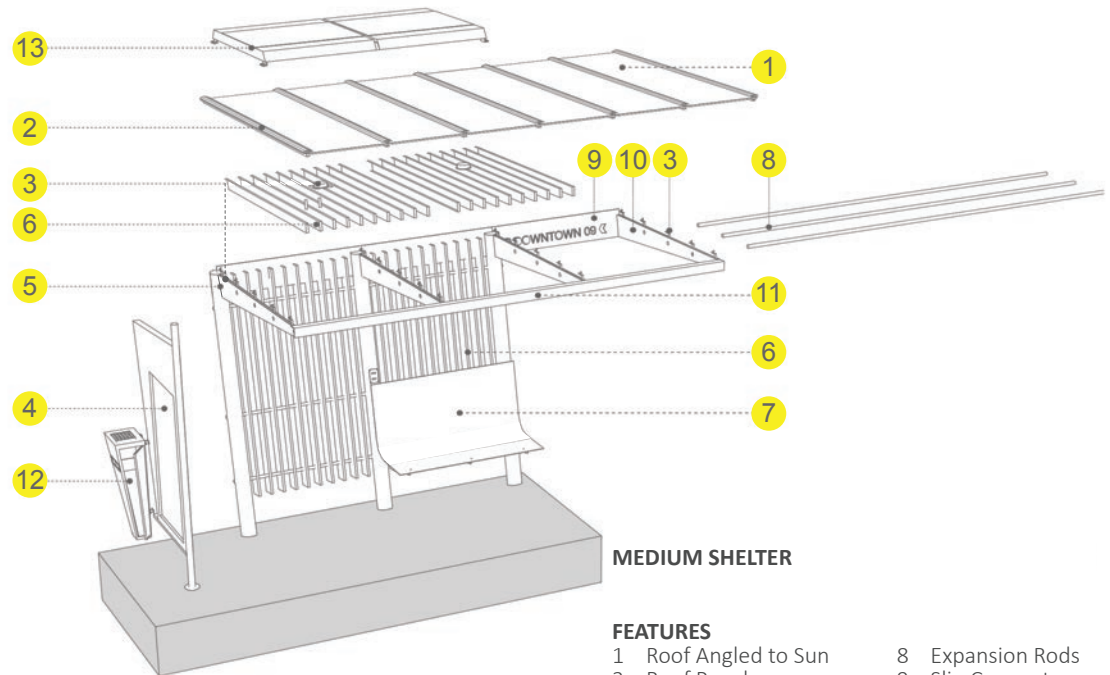
RESEARCHING

“THE MAIN CONCERN (OF RIDERS) IS HAVING AN ACTUAL SHELTER - A SEAT AND RAIN PROTECTION - NOT JUST BUS STOPS. MORE SHELTERS IN DIFFERENT TYPES OF AREAS.”

DART Citizen Advisor, 2022



MINI SHELTER



MEDIUM SHELTER

FEATURES

- | | |
|--------------------------|------------------|
| 1 Roof Angled to Sun | 8 Expansion Rods |
| 2 Roof Panels | 9 Slip Connector |
| 3 Safety + 911 Lighting | 10 Standard Beam |
| 4 Visual + Audio Signage | 11 Edge Strip |
| 5 Standard Column | 12 Trash Can |
| 6 Art Screen | 13 Solar Panels |
| 7 Integrated Seat | |

what if...

EVERY SHELTER HAD A PLACE TO SIT?

DART, like many bus systems, has a range of shelter models and amenities including shelters, trash cans, benches, and signage that are independent from one another. Different amenities are placed in various stop locations based on ridership numbers and distance between shelter locations. DART riders have strongly articulated the desire to have basic comforts, including a place to sit at all stops, not just shelters. Riding the DART system, it is common to see patrons sitting on curbs or ledges next to stops or sitting on their own portable chairs to wait for the bus.

Design Strategy: Deploy a kit of parts approach to enable a bus stop to convert into a bus shelter overtime without removing and replacing existing amenities, thus reducing expenses associated with deployment. Designing a system that can accommodate primary rider needs at the stop (including a place to sit and shade cover) while having the ability to expand as rider needs change provides a flexible design strategy. The redistribution of funds to support stops with seats may provide more equitable amenity coverage across the DART service area.

RESEARCHING

STUDIES SHOW THAT THE PRESENCE OF MULTI-COLORED DESIGNS DISCOURAGES GRAFFITI AND NEGATIVE BEHAVIOR IN PUBLIC SPACES SUCH AS BUS SHELTERS.

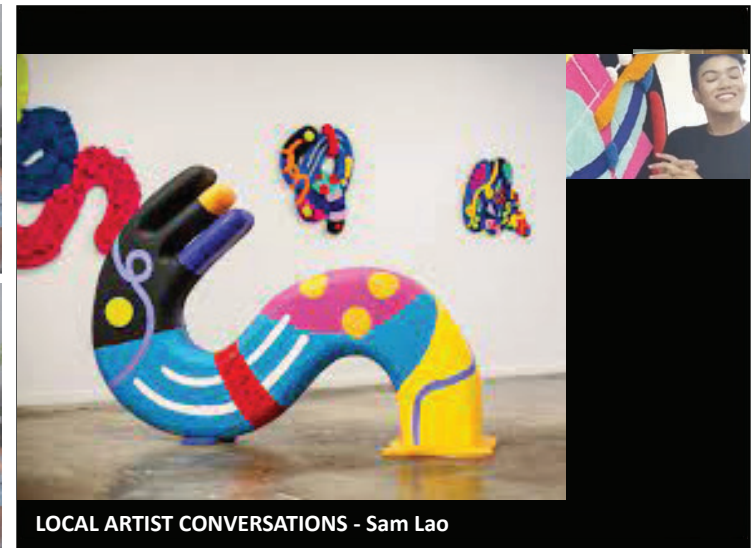
Americans for the Arts, 2018

what if...

EVERY STOP WAS AN ART GALLERY?

Research shows that investing in public art can improve street safety, increase tourism and jobs, and combat social isolation. Art can also raise awareness about important public health and social issues. 81% of Americans believe the arts are “a positive experience in a troubled world,” yet not all communities have equal access to arts and cultural resources. In Dallas, urban core arts destinations make up less than 2% of the city’s land area. Expanding the presence of public art to residential and under resourced areas of the city may encourage strong cultural ecosystems at the neighborhood scale.

Design Strategy: Manage bus shelter construction costs to include a \$2,000 budget for local art. Partner with programs like the City of Dallas Public Art Program to work with local artists and community members to design art works for neighborhood shelters that celebrate the culture of place. Bus shelters will transform into public gallery spaces that represent the communities in which they’re located, further building neighborhood ownership and pride.



ONE TREE
planted at every bus stop adds natural shade, decrease perceived wait time, and cleans the air

EXPANSIVE ROOF
can shift on columns to optimize sun and weather protection based on street grid orientation (45 - 90 degrees north/south)

SOLAR PANELS
positioned on roof to maximize 15-18 degree sun angle

INTEGRATED LIGHTING + SPEAKERS
embedded within beams signal to riders that bus is approaching in languages that are commonly spoken in a specific location

LOCAL ART
designed to reflect the identity and culture of the stop location

ANGLED COLUMNS
optimize integrated seat comfort and provides feeling of safety for those waiting for the bus

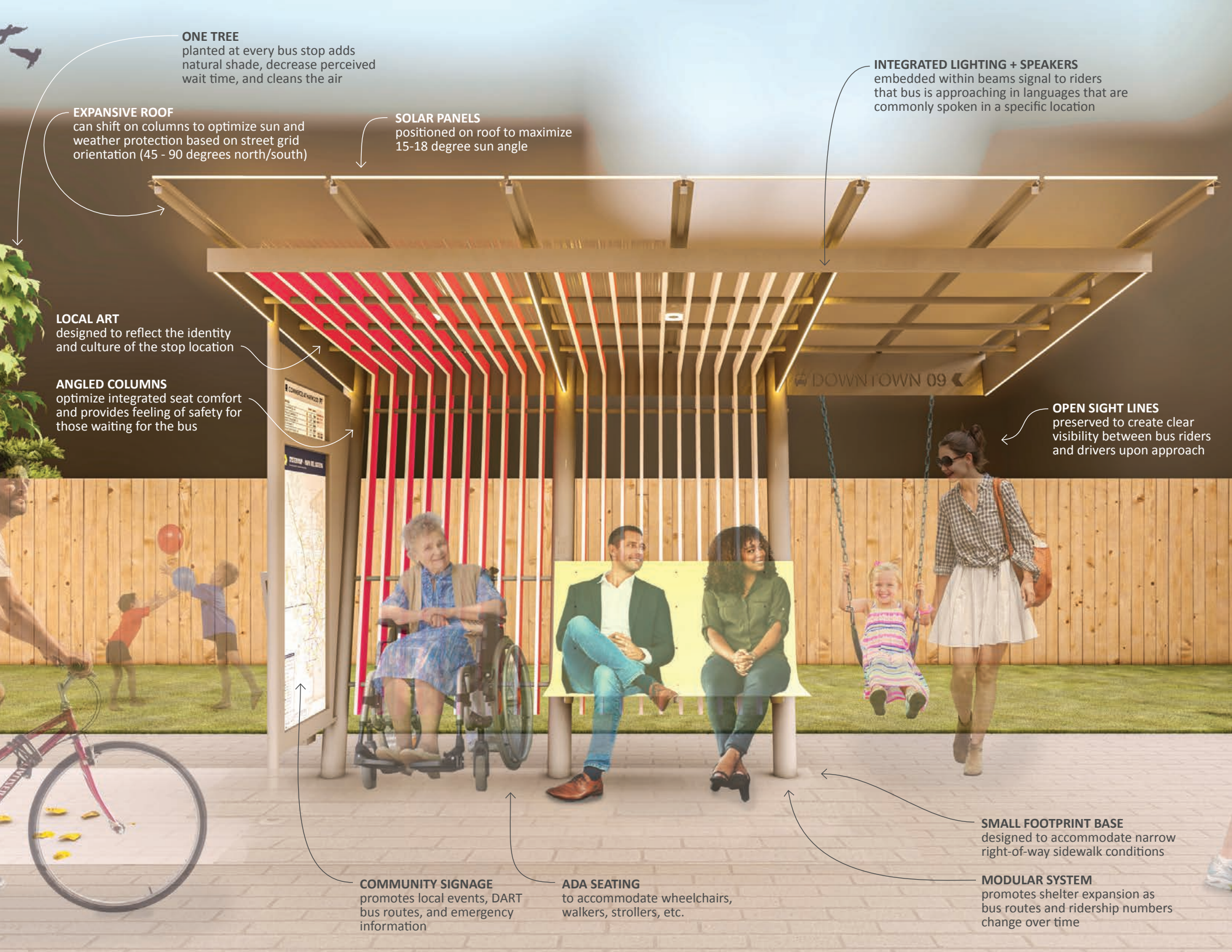
OPEN SIGHT LINES
preserved to create clear visibility between bus riders and drivers upon approach

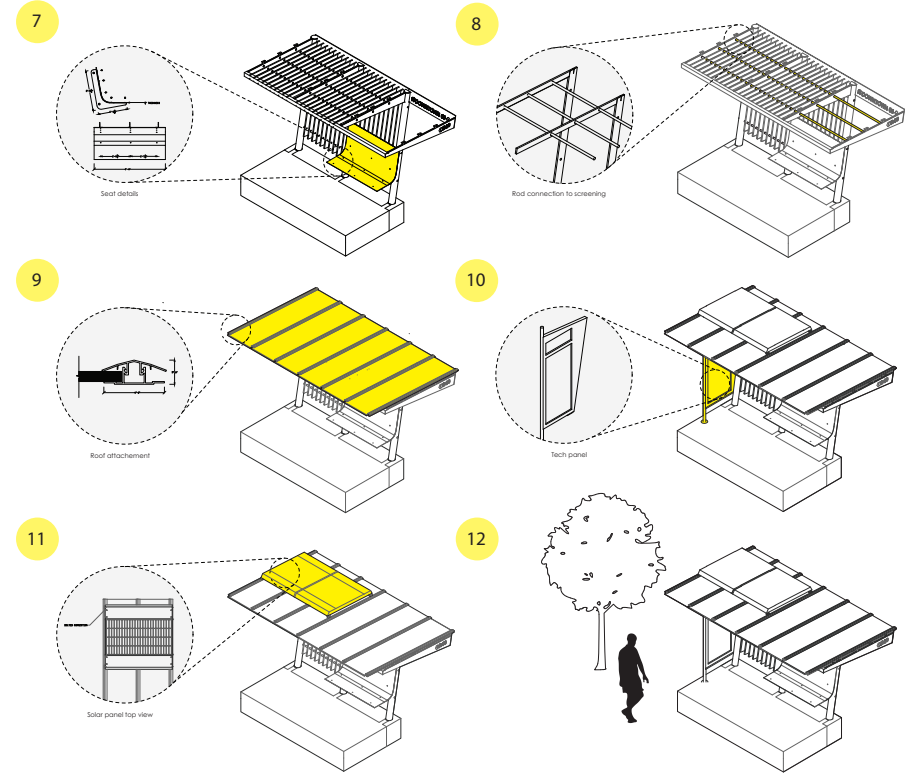
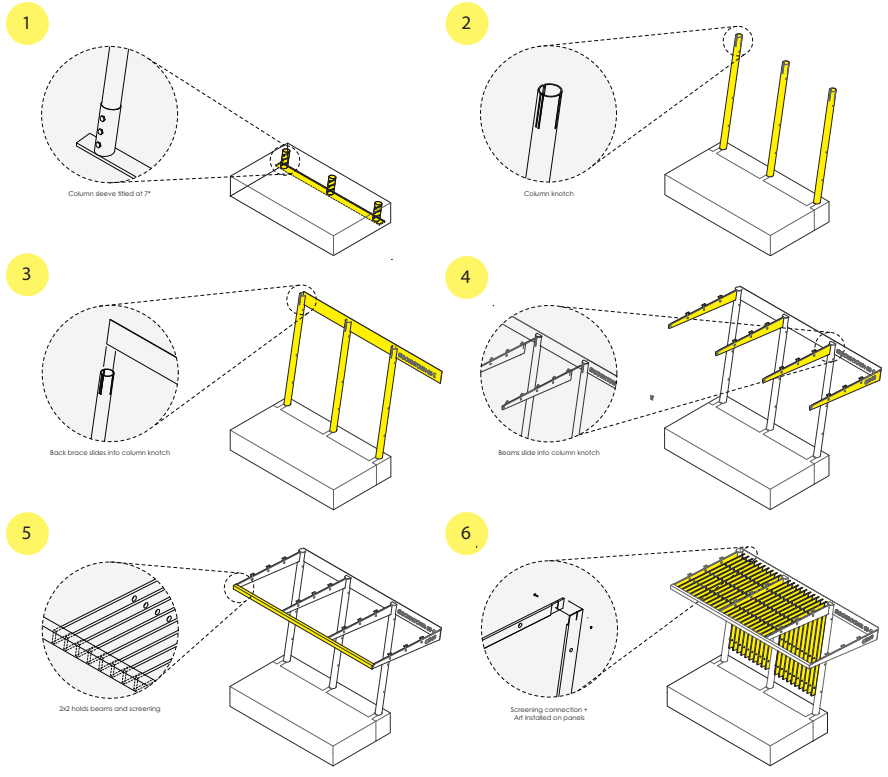
COMMUNITY SIGNAGE
promotes local events, DART bus routes, and emergency information

ADA SEATING
to accommodate wheelchairs, walkers, strollers, etc.

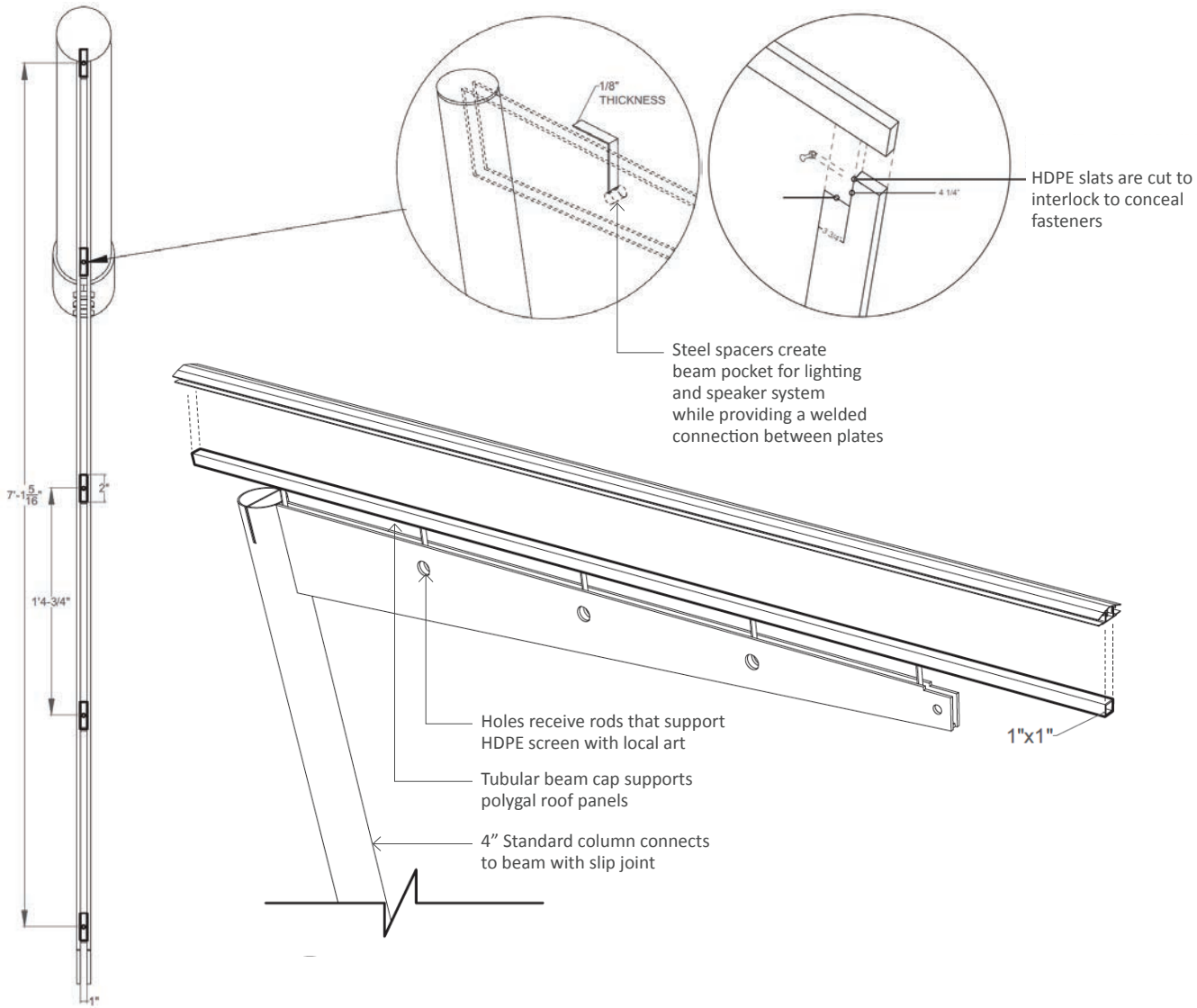
SMALL FOOTPRINT BASE
designed to accommodate narrow right-of-way sidewalk conditions

MODULAR SYSTEM
promotes shelter expansion as bus routes and ridership numbers change over time



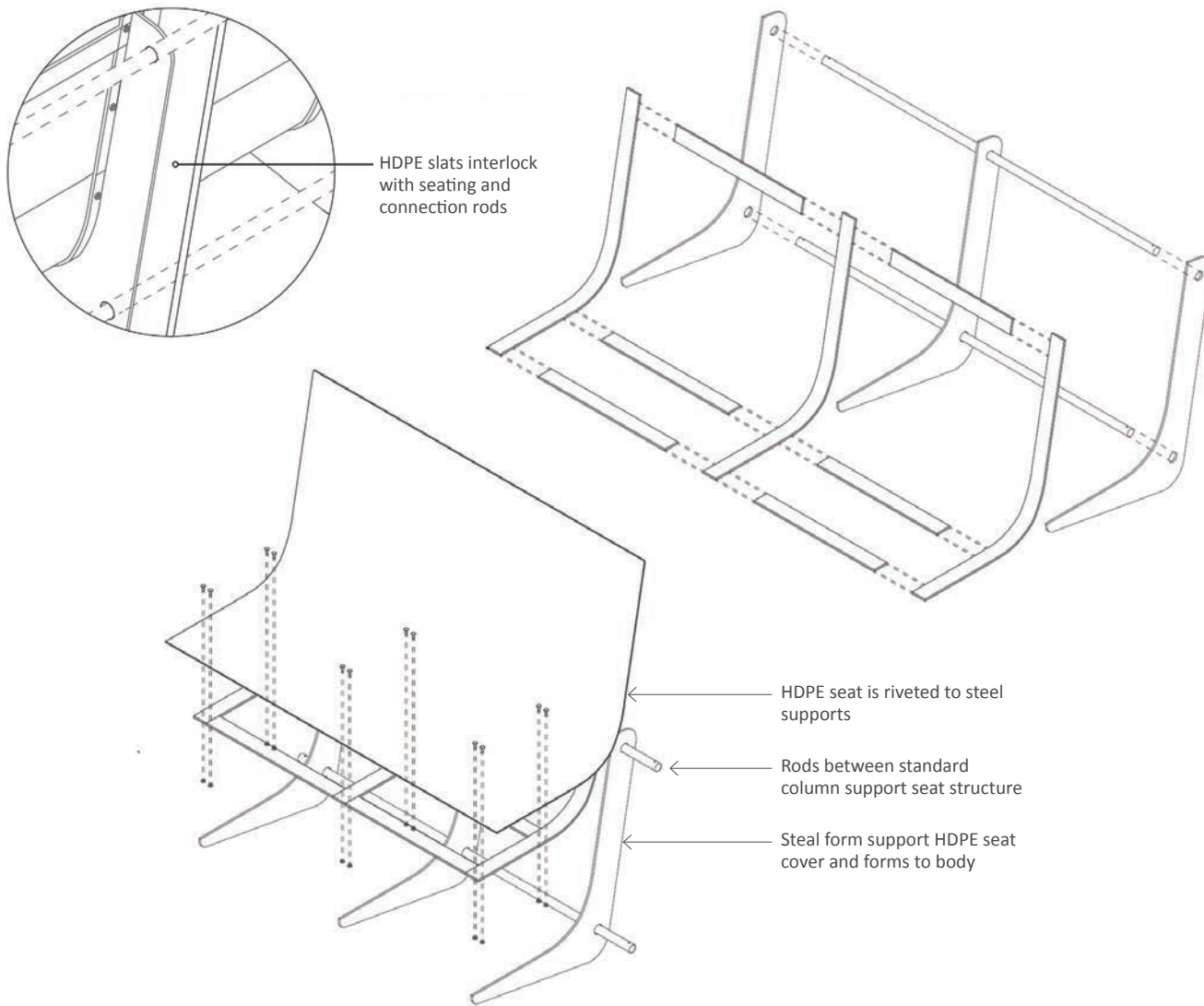


DESIGNING - KIT OF PARTS

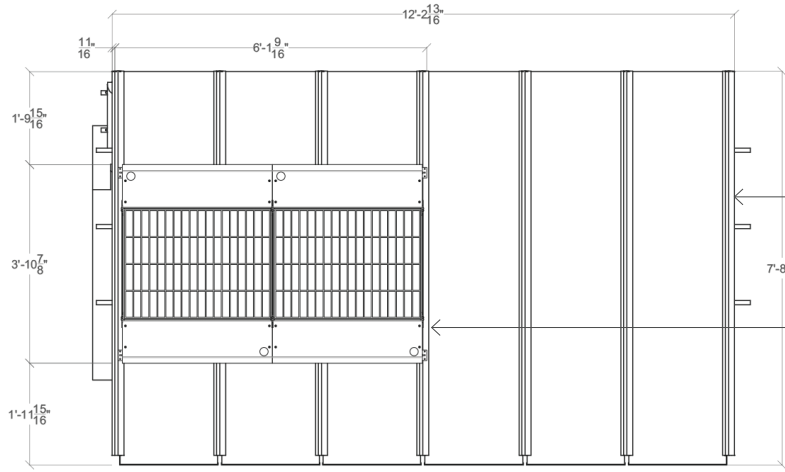


MAKING

Students fabricated the shelter at the university's design build lab and collaborated with a wide range of material suppliers, fabricators, sustainability technicians, and engineers. This educational model seeks to influence students to become future design professionals who are capable of managing non-traditional projects and understand the value of working with craftsman. All work on the final prototypes were performed by students including material cutting, welding, assembly, detailing, and erection.

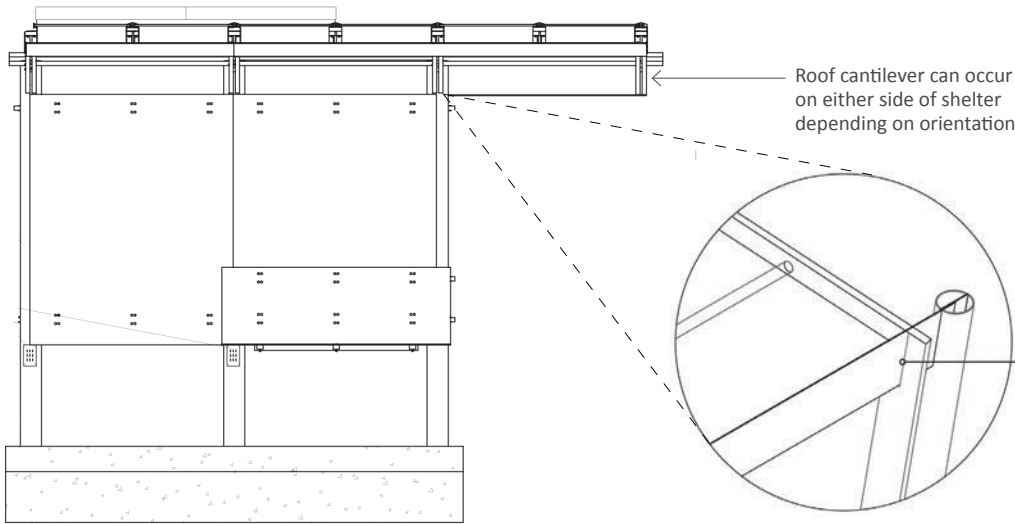
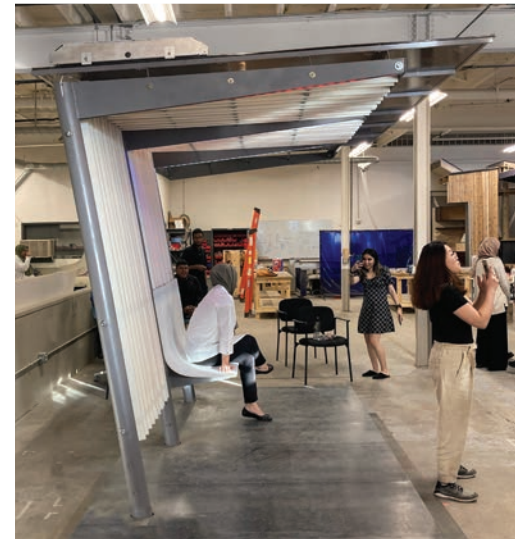
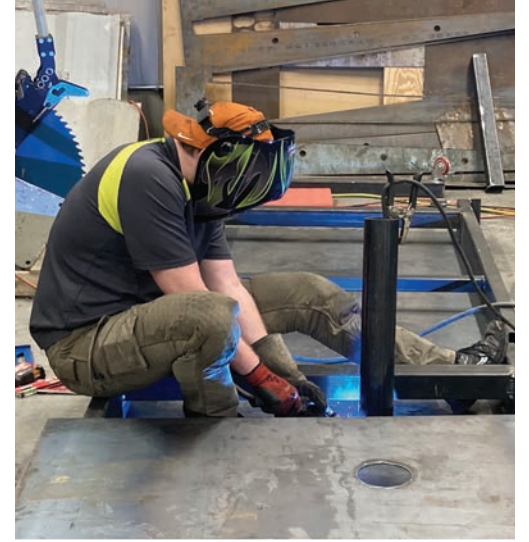


MAKING



Shelter can expand in 4' increments

Solar panel supported by beams



Roof cantilever can occur on either side of shelter depending on orientation

7.5" slit in slip connector plate to lock columns together

MAKING



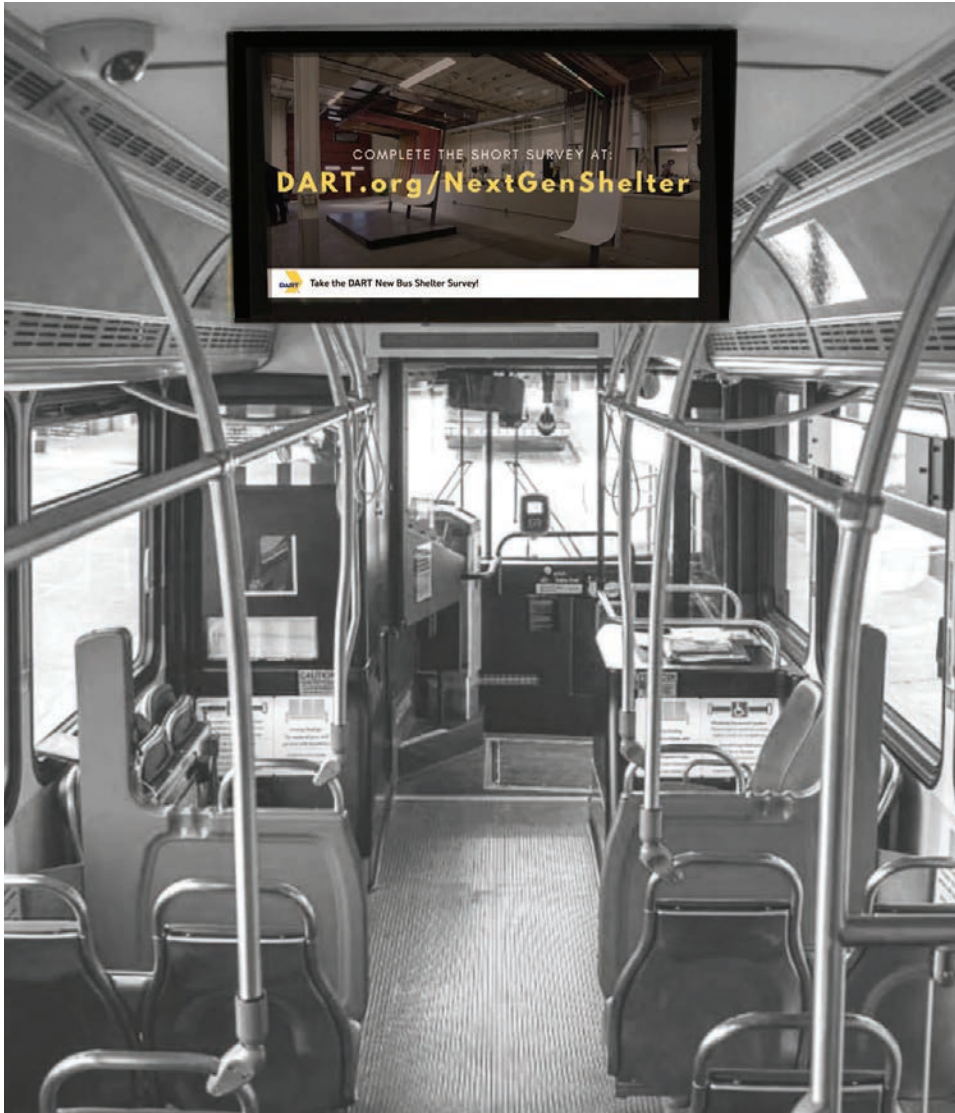
Photo Credit: Chad M. Davis, AIA



SHARING - 1 NIGHT OPEN HOUSE



SHARING - 3-MONTH GALLERY EXHIBIT



Total Responses

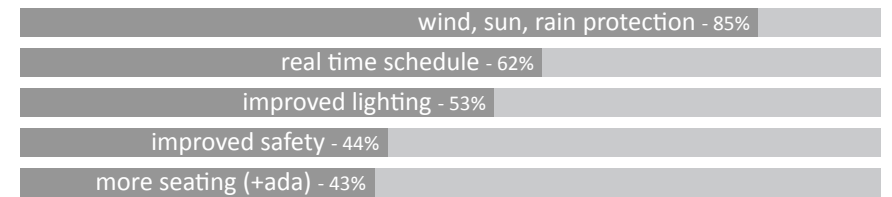
4,264 (90% bus riders / 9.7% non bus riders)

Current DART Shelter

How would you rate DART's existing bus shelters?



What are the top 3 areas in which DART can improve its existing shelters?

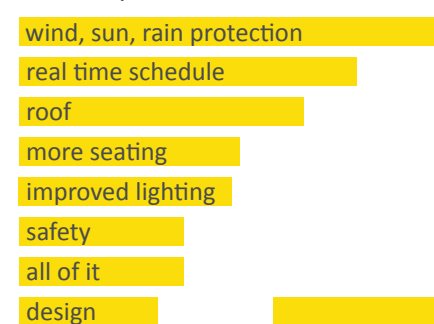


New DART Shelter Prototype

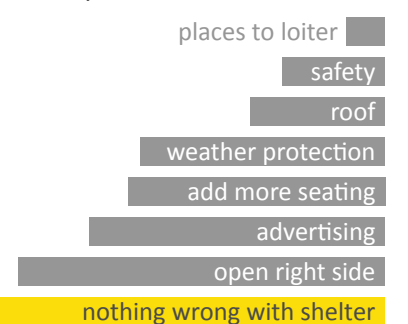
Do you feel that the new shelter is an improvement from the current one?



What do you like most in the shelter?



What do you like least in the shelter?



ACADEMIC EXPLORATION IN SERVICE OF THE PUBLIC, DISRUPTS AND RE-ORIENTS MUNICIPAL PRACTICE TOWARD VALUING DESIGN AS AN ESSENTIAL ACT OF CITY MAKING.

EVOLVING

Since beginning in September 2022, this project has sparked numerous conversations between DART, transit riders, architects and urbanists about the importance of design in the creation of public spaces their amenities. Student work is currently being advanced by local architecture firms and manufacturers. Four built prototypes will be installed at DART stops to garner additional public input. This work illustrates how maximizing the impact of small-scale interventions across geographies has the potential to redefine the city.



Photo Credit: Chad M. Davis, AIA

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