Pathway Goal: Infrastructure and Shared Governance

Action Item #
N/A

Report:
☐ Mid-Year: December 2016
☒ Year-End: April 2017

Action Item Description:
To enhance the image and safety of UNLV through improved wayfinding.

Submitted By:

Name                Department
Kyle Kaalberg        Office of the President

Working Group Members:

Name                Department
Phillip Zawarus      Architecture
Dave Frommer         Planning and Construction
Nancy Rapoport       Office of the President

Provide a written overview of the year-long process for your working group.

Determination of Areas of Focus/Group Charge
Investigate wayfinding
Provide recommendations by fall 2017

2016-17 Accomplishments

Wayfinding was a semester long study conducted through the School of Architecture at UNLV. The charge for Wayfinding (during 2016-17) was to investigate the current campus wayfinding and develop a plan which would greatly improve wayfinding, making UNLV a friendly and safe campus. Under the direction of Phillip Zawarus, School of Architecture, his seminar class tackled this issue during the spring of 2017 and prepared a final report.

Recommendations

See next steps.
### 2017-18 Next steps

- What should the goals / activities be for the subcommittee?
- Who should be responsible?

Recommendations from the report need to be considered and appropriate actions taken. A chair for this subcommittee needs to be appointed, and the chair will need to compose an appropriate subcommittee.

Please review the list below and “X” the appropriate box(es).

| ☐ Potential resources required |
| ☒ Any reports generated by this working group |
|     *UNLV Campus Wayfinding Proposal* |
| ☐ Metrics to be used |
| ☐ No additional reference material |

Any additional information you wish to share.
Our organization’s mission is to do community-based design in Las Vegas. We improve the built environment through research and innovation. We pursued, with partners, a Wells Fargo UrbanLIFT grant. It funds efforts to make healthy neighborhoods in areas of need. Our successful proposal was to clean up, enhance, and re-inspire interest in an urban trail, the Cedar Trail, in a low-income neighborhood. In the non-profit sector, budgets can be challenging. Corian presented to us the ability to cover a broad area effectively and affordably. Corian had a set of qualities helping us meet our needs. It was cost-effective, stable in the Las Vegas climate, and easily malleable.

We used Corian to make signs in the ground along the trail. That let us eliminate graffiti-ridden signs of all shapes, colors and sizes along the trail. Our new signage includes wayfinding, mile markers and other information, into a legible set of signs having a strong identity and unique expression.

Our images describe the context, process and in-progress installation to rehabilitate a public trail in a low-income community. We worked with a local non-profit, the community, and the Las Vegas city government to gain consensus on the installation of a new paradigm for signs along trails. This combination of context, process and installation proves the viability of Corian to functionally and aesthetically elevate projects in the public realm. The results of our installations of the Corian signs outside demonstrated the capacity of Corian to operate as an in-ground material in a public right of way. Corian allowed us to elegantly minimize impacts of vandalism; and clean up the cacophony of signage detracting from the trail experience. The new trail will have an enhanced and unified identity and be a unique place. Corian had a unique confluence of factors for our needs. It was easy to mill. Nearly any design was possible through digital design programs, we could put...
EXISTING SIGNS

Vertical signs on the trail are primarily at intersections with the streets. The number of signs at each intersection ranges between five and eight. Due to tagging, these signs are no longer legible or usable for trail users and emergency responders. Public officials want to move signs higher, but this will make reading the signs difficult. The ground is not often tagged and might be a place for signage.

TRAIL LIGHTS

Light posts along the trail can have damage. Light outage promotes more vandalism to trail signs and other amenities due to the resulting dark environment. The signposts are also dark colored and under designed as trail elements.

SURROUNDING COMMUNITY

Unlike this residence, most users block off visual access to the trail. This creates a chronic issue. As the trail gets more dilapidated, the more people separate from it. The next door neighbor to the right is in the process of putting up a wall to the trail.

CEDAR TRAIL

DIAGNOSING ISSUES & OPPORTUNITIES

TRAIL CONDITION
CEDAR TRAIL DESIGN DEVELOPMENT & ITERATIONS

DESIGN DEVELOPMENT
CORIAN AS A MALLEABLE MATERIAL IN THE DIGITAL FABRICATION PROCESS

MILLING ITERATIONS
Various fonts and sizes were explored in the milling process to determine the most legible and durable design.

ASKED TO EXPLORE RAISED LETTERS
Experimenting with raised letters at different heights to find the optimal height that maximizes legibility while minimizing potential tripping hazards.

PUBLIC AND AGENCY FEEDBACK
Cutting into Corian allows for dust to collect, potentially reducing the legibility of information and increasing maintenance requirements.

TESTING HEIGHTS
Heights exceeding 1/16" may cause tripping for trail users.

CORIAN AS A MALLEABLE MATERIAL
- ROUNDED 55˚ - 60˚
- OPTIMAL ANGLE

REDESIGN / REBUILD
The corners on the letters were rounded to prevent chipping and injury. Different beveling and corner conditions were also tested.

OPTIMIZED RAISED LETTER DESIGN
Raised letters at a height of 1/16" and a 55-degree bevel on corners eliminated tripping and were unnoticeable to cyclists.

PUBLIC AND AGENCY FEEDBACK
Cutting into Corian allows for dust to collect, thus losing legibility of information and increasing maintenance.

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OPTIMIZED RAISED LETTER DESIGN
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Through digital fabrication techniques, we easily leveraged the malleability of the material. We were able to quickly go through several iterations to optimize the parameters shown on the previous page.

**Routing Tool Exploration**
We tested various bits for their different routing and finishing capabilities. We used a spiral flute bit to pocket out letters. The v-groove bit was used to create seams or wedges in the material. The tool path for each bit was drastically different and played a big role in our decision choosing a bit.

**CNC Tool Path**
The tool path for the spiral flute required the bit to pocket out all the Corian material except for the letters. The v-groove bit only needed to follow the lines where we wanted to make grooves (i.e., the wave pattern and border around the letters). This reduced our milling time dramatically. The grooves were still at the optimal 1/16" depth to create legible purposes.

**Corian Installation Detail**
The new design with the v-groove bit also allowed for the installation of the Corian to be flush with the existing asphalt trail, whereas the previous iteration was raised 1/16" above grade, creating a potential tripping hazard.

**Spiral Flute Bit**
The spiral flute bit could create smooth and varied bevels, but the long milling time and strain on the bit was not efficient, limiting additional texturing on the Corian surface.

**V-Groove Bit**
The v-groove bit has a 60 degree angle. The beveled letters and waves make contrast and relief on the material to increase legibility.

As shown below, the bit would create circular indents into the letters. By adding a border around the letters, the bit would smooth the letter edges for a clean finish.

The new design with the v-groove bit also allowed for the installation of the Corian to be flush with the existing asphalt trail, whereas the previous iteration was raised 1/16" above grade, creating a potential tripping hazard.
CEDAR TRAIL
ENVIRONMENTAL
GRAPHICS & LEGIBILITY
WAYFINDING
UNLV CAMPUS STUDY
- IDENTITY

There are 78 emergency call boxes on campus, 95% of travel paths fall on or within 100 ft of a call box. You can see that they are clustered amongst areas of high foot traffic and even placed incrementally in areas of unlikely foot traffic. The boxes could use a little updating, though. While the blue light on top can be easily seen from extreme distances if unobstructed, the boxes themselves are not lit and can be hard to read at night. This is compensated for by being very user friendly, 1 big red button is all you need to see. Another issue is obstruction by vegetation. There is 1 new emergency call box that has been installed and it takes care of both issues, it has a high and low blue light and is lit by normal light where the button is.

This map shows emergency call box locations; night-time building use; and night-time, pedestrian circulation paths. The purpose of this map is to find out if the emergency call boxes fall on likely travel paths of the demographic that would be on campus at night, which is often the most dangerous time to be walking.

Building color denotes the rate of nightly usage; yellow represents buildings that are often used for events or weekly but not open all the time; orange designates popular public spaces and buildings open 24/7 to students; and red portrays buildings constantly in use even at night, such as dorms or parking structures.

Obviously, all of campus is widely trekked through with all manner of shortcuts relentlessly taken, but this map shows the major routes used. Taking hierarchy even one step further, out of the main routes, I’ve dictated which of those are used most. You can see a high traffic grid is formed around the CDC.

PEDESTRIAN CIRCULATION & USAGE

Parking Structure
Reserved
Mixed Use/Events
Free Parking
Student/Staff Only
Bus
Residential
Parking Meters

NIGHT CIRCULATION & SAFETY

Parking Structure
Reserved
Mixed Use/Events
Free Parking
Student/Staff Only
Bus
Residential
Parking Meters

Diagram of campus showing key areas of focus for pedestrian circulation and safety. The map highlights areas with high, medium, and low pedestrian traffic, as well as key emergency call box locations and the layout of major buildings and facilities on campus.
WAYFINDING

HEALTH & WELL-BEING
- WALKABILITY

Site Analysis Circulation

Pedestrian Desire Lines
Pedestrian desire lines follow main pathways with a tendency to cut corners and across large open areas.

Seating
Monolithic stone tables are in various locations throughout the site, each allowing up to 8 people to sit together.

Cart Traffic
Service carts use main pathways to get around, mostly security, maintenance and school faculty.

Emergency Lanes
Paths are required to be at least 15' to accommodate emergency vehicles such as ambulances and fire trucks.

A Natural Response: Ecologically Based Campus Design

Typical Seating
Foot traffic impacting roots
Walking Paths

Wide Walking Paths Allow For High Traffic Volumes
15' Minimum Width For Emergency Vehicles
WAYFINDING

ARBORETUM
- OUTDOOR COMFORT

UNLV Campus Ecological Quality

- Designated The Entire Campus As The Nevada State Arboretum
- 17% Tree Failure
- 22% Permeable
- 11% Biodiverse

A Natural Response: Ecologically Based Campus Design

- Turf 1.7 million sq ft
- Concrete 1.5 million sq ft
- Buildings 6.6 million sq ft
- Asphalt 5 million sq ft

3,227 Trees
- 2,680 Good 83.0%
- 434 Fair 13.4%
- 64 Poor 2.6%
- 22 Dead/Dying 0.7%

Data Source: [treecountinventorystudyforunlv/UNLVTrees.shp]
WAYFINDING
ARBORETUM
- OUTDOOR COMFORT

Site Analysis Climates Conditions

Too Hot
Temperatures that exceed 90 degrees start to become uncomfortably warm.
April 15, 2015, 11:15:24 PM
Too Hot 79% of the time Comfortable 21%

Comfortable
Temperatures within the range of 72-88 degrees are the most comfortable for people.
March 4, 2016, 11:23:02 AM
Too Hot 44% of the time Comfortable 44% Too Cold 11%

Too Cold
Temperatures that fall below 70 degrees start to become uncomfortably cold.
February 13, 2016, 12:34:15 PM
Comfortable 63% of the time Too Cold 37%
Precedent Study
- Examining which Wayfinding projects and examples work
- Visiting various regional campuses and firms successful in wayfinding

Analysis & Design Development
- Analyzing Campus opportunities and constraints
- Synthesizing analysis with precedent study to determine appropriate solutions
- Design and detail wayfinding components through iterations and development

Fabrication & Sampling
- Utilize school and local resources to construct scaled mock ups
- Provide planning and representation visuals for campus strategic application
THIRD-PARTY WAYFINDING PLANNING COST: DESIGN COST: FABRICATION COST:

$10,000 - $50,000 $35,000 - $75,000 $75,000 - $150,000

CONCEPT DESIGN

PLANNING SCOPE

DESIGN BRIEF

WAYFINDING

THIRD-PARTY COST ESTIMATES

UNLV SCHOOL OF ARCHITECTURE
Louisiana State University

Timeframe: 2009-2011

Design Fee: $180,000

Fabrication/Installation Cost: $1.2 million
WAYFINDING

PRECEDENT STUDIES - DESIGN & FABRICATION

College of the Atlantic

Timeframe: 2005-2008
Design Fee: $45,000
Fabrication/Installation Cost: $97,500

Cost: $97,500
WAYFINDING

PRECEDEANT STUDIES
- DESIGN & FABRICATION

Harvard University
Timeframe: 2004-2005
Design Fee: $45,000
Fabrication/Installation Cost: $67,500
WAYFINDING

PRECEDENT STUDIES

- COMPONENTS