

Bridging Data and Design within Austin's Moped Map

City of Austin, TX Department of Transportation and Public Works | Data and Technology Services

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Keywords:

User Interface Design, User Research, Data Visualization & Interaction, Transportation, Maps

Summary:

As a UI/UX Design Fellow with the City of Austin's Department of Transportation and Public Works, Olivia was the first designer to **evaluate and prototype design recommendations for a newly launched interactive map on Moped**, a platform that manages all the city's mobility-infrastructure projects. She led user testing with eight transit planners and collaborated closely with Moped's Principal Software Developer and Senior Product Manager. Her work focused on integrating the map's visual data representation with Moped's existing features, resulting in fully interactive Figma prototypes ready for handoff.

Bridging Data and Design within Austin's Moped Project Map

Data & Technology Services

City of Austin, TX – Transportation and Public Works Department

Patrick McDonnell – Senior Product Manager

coding it forward >



TRANSPORTATION
PUBLIC WORKS

Olivia Luk

Carnegie Mellon University
Design, HCI, Gender Studies

Background & Context

CONTEXT

Austin's population is growing,
and so are its traffic and mobility
related infrastructure projects!



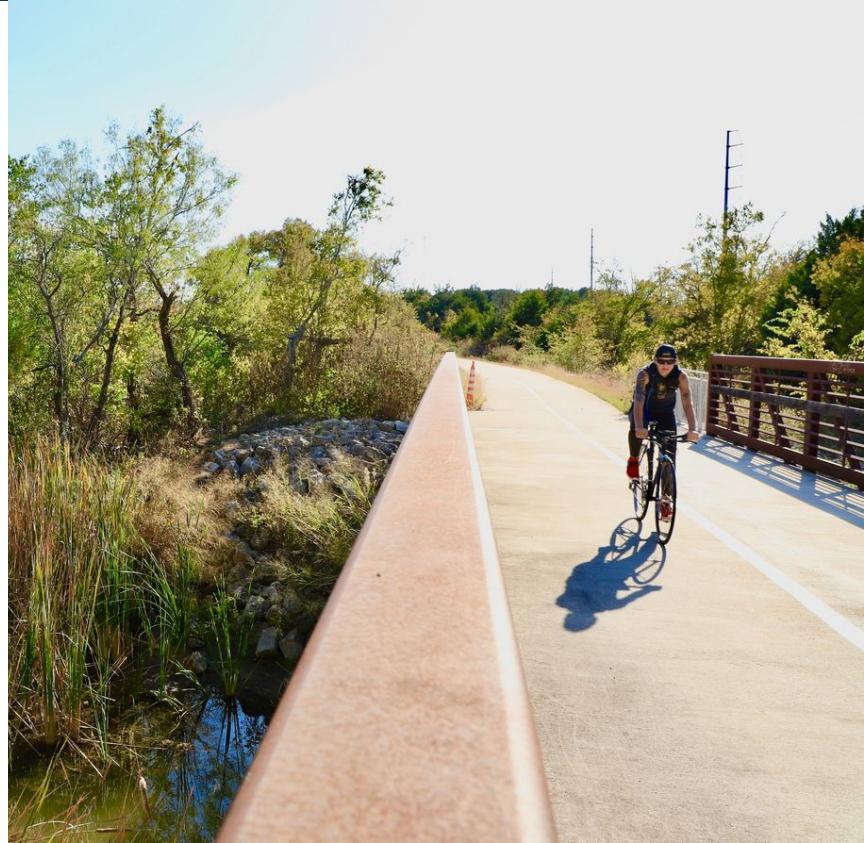
CONTEXT

Installing new traffic signals...



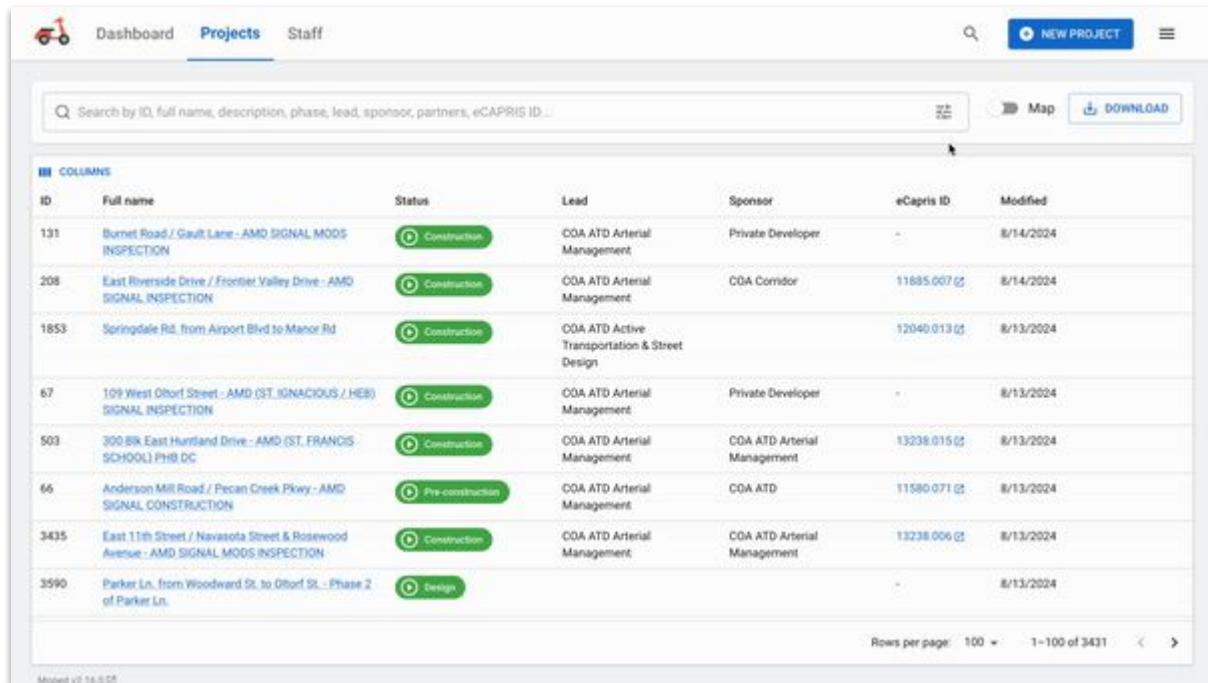
CONTEXT

Planning a new bike path...



WHAT IS MOPED?

Moped is a platform for the City of Austin's Transportation and Public Works staff to **track mobility-related infrastructure projects**.

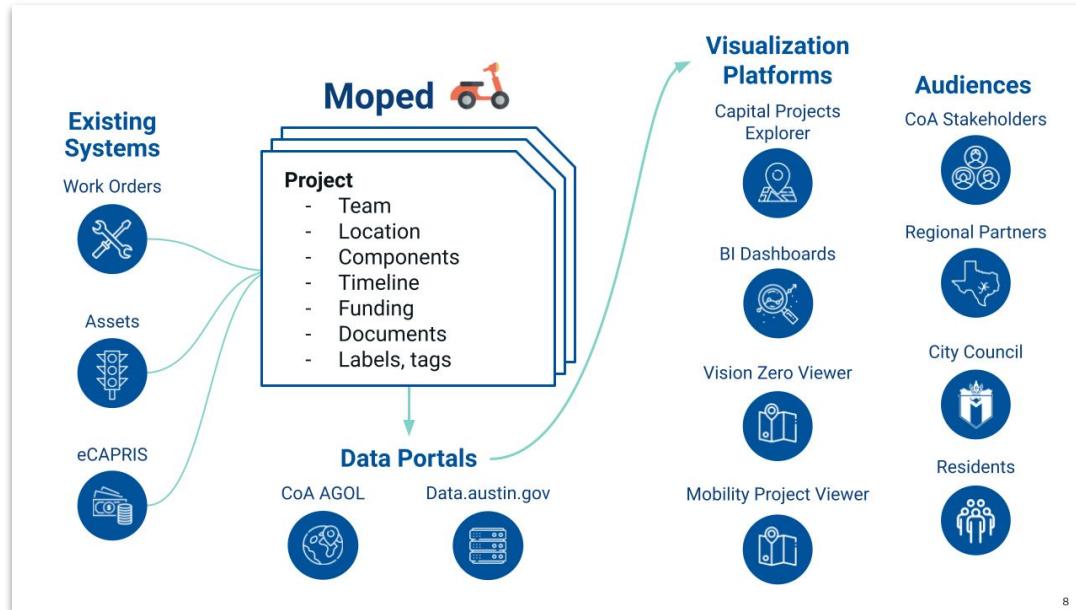


The screenshot shows the Moped application's "Projects" page. At the top, there are navigation tabs for "Dashboard", "Projects" (which is selected and highlighted in blue), and "Staff". To the right of the tabs is a search bar with placeholder text "Search by ID, full name, description, phase, lead, sponsor, partners, eCAPRIS ID...". Below the search bar are buttons for "Map" and "Download". The main area displays a table of projects with the following columns: ID, Full name, Status, Lead, Sponsor, eCapris ID, and Modified. The table lists eight projects, each with a green circular status button indicating its current phase (e.g., Construction, Pre-construction, Design). The last row shows a total of 3431 projects, with pagination controls for "Rows per page: 100" and "1-100 of 3431".

ID	Full name	Status	Lead	Sponsor	eCapris ID	Modified
131	Burnet Road / Gault Lane - AMD SIGNAL MODS INSPECTION	Construction	COA ATD Arterial Management	Private Developer	-	8/14/2024
208	East Riverside Drive / Frontier Valley Drive - AMD SIGNAL INSPECTION	Construction	COA ATD Arterial Management	COA Corridor	11885.007	8/14/2024
1853	Springdale Rd. from Airport Blvd to Manor Rd	Construction	COA ATD Active Transportation & Street Design	-	12040.013	8/13/2024
67	109 West Oltorf Street - AMD (ST. IGNATIOUS / HEB) SIGNAL INSPECTION	Construction	COA ATD Arterial Management	Private Developer	-	8/13/2024
503	300 Blk East Huntland Drive - AMD (ST. FRANCIS SCHOOL) PHB DC	Construction	COA ATD Arterial Management	COA ATD Arterial Management	13238.015	8/13/2024
66	Anderson Mill Road / Pecan Creek Pkwy - AMD SIGNAL CONSTRUCTION	Pre-construction	COA ATD Arterial Management	COA ATD	11580.071	8/13/2024
3435	East 11th Street / Navasota Street & Rosewood Avenue - AMD SIGNAL MODS INSPECTION	Construction	COA ATD Arterial Management	COA ATD Arterial Management	13238.006	8/13/2024
3590	Parker Ln. from Woodward St. to Oltorf St. - Phase 2 of Parker Ln.	Design	-	-	-	8/13/2024

Moped v2.16.0.25

WHAT IS MOPED?



Moped Overview

MOPED PROJECT MAP

The screenshot shows a web-based project management system interface. At the top, there's a navigation bar with icons for Dashboard, Projects (which is the active tab), and Staff. To the right of the navigation are search, new project creation, and download buttons. Below the navigation is a search bar and a map button. The main content area is a table listing various projects. The columns are labeled: ID, Full name, Status, Lead, Sponsor, eCapris ID, and Modified. Each row contains a link to the project details. The status column includes icons for Construction, Pre-construction, and Design. The modified column shows dates ranging from 8/13/2024 to 8/14/2024. At the bottom of the table, there are pagination controls for rows per page (100) and a total count of 3431.

ID	Full name	Status	Lead	Sponsor	eCapris ID	Modified
131	Burnet Road / Gault Lane - AMD SIGNAL MODS INSPECTION	Construction	COA ATD Arterial Management	Private Developer	-	8/14/2024
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503	300 Blk East Huntland Drive - AMD (ST. FRANCIS SCHOOL) PHB DC	Construction	COA ATD Arterial Management	COA ATD Arterial Management	13238.015	8/13/2024
66	Anderson Mill Road / Pecan Creek Pkwy - AMD SIGNAL CONSTRUCTION	Pre-construction	COA ATD Arterial Management	COA ATD	11580.071	8/13/2024
3435	East 11th Street / Navasota Street & Rosewood Avenue - AMD SIGNAL MODS INSPECTION	Construction	COA ATD Arterial Management	COA ATD Arterial Management	13238.006	8/13/2024
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Rows per page: 100 ▾ 1–100 of 3431 < >

Moped Map

FELLOWSHIP TIMELINE

Five sprint cycles...



Week 1-2
**Background
Research &
Planning**

Week 3-4
User Testing

Week 5-6
**Synthesis &
Ideation**

Week 7-8
**Design &
Prototyping**

Week 9-10
**Design, Prototyping
& Refinement**

Research

TESTING OBJECTIVES

1. Identify different Moped **user groups** and **use cases**, and compare these different user experiences.
 - *Proficiency Levels*
 - *Teams/Roles*

TESTING OBJECTIVES

1. Identify different Moped **user groups** and **use cases**, and compare these different user experiences.
 - *Proficiency Levels*
 - *Teams/Roles*
2. Evaluate the general **usability** of the Moped Map.

TESTING PARTICIPANTS

8 Moped Users...

TESTING PARTICIPANTS

8 Moped Users...

4

Different Divisions



TESTING PARTICIPANTS

8 Moped Users...

4

Different Divisions



All

Levels of Proficiency



TESTING METHODS

Moped User Testing Interest Form

ex-olivia.luk@austintexas.gov Switch account 

* Indicates required question

Background Info

What TPW division are you in? *

Your answer

What is your job title? *

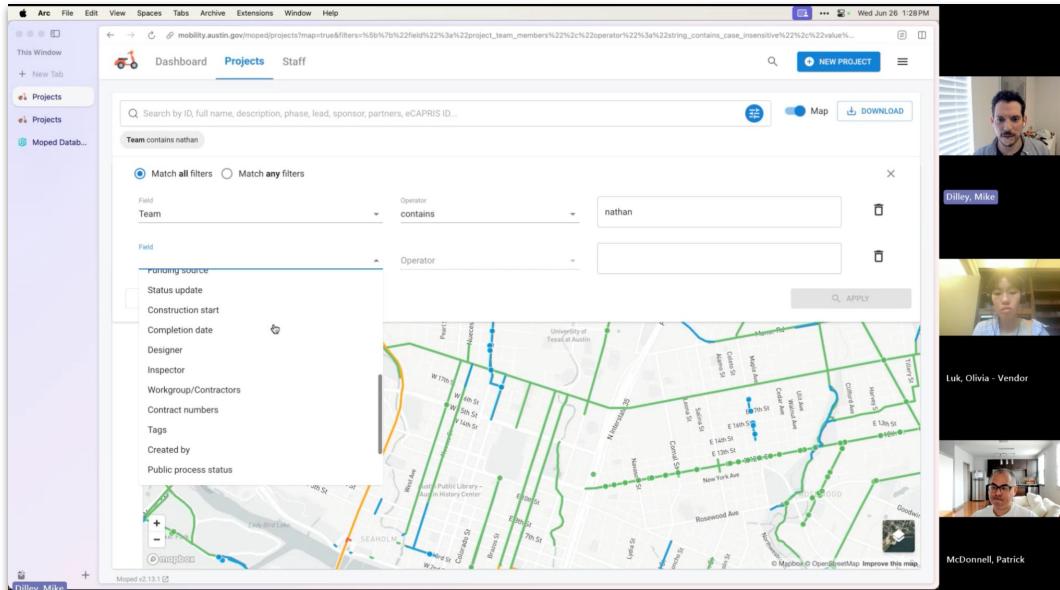
Your answer

How often do you use Moped? *

- Multiple times a day
- Daily
- Weekly
- Monthly
- Yearly

Survey

TESTING METHODS



Think-Alouds

Insights

THEME 1: USE CASE

INSIGHT

Moped serves as a tool for
passive communication,
enhancing transparency within
TPW.

The majority of Moped's use cases
fall under two main categories:
Internal Division Communication,
and **External Department-Wide
Communication**

THEME 1: USE CASE

INSIGHT

Moped serves as a tool for **passive communication**, enhancing transparency within TPW.

The majority of Moped's use cases fall under two main categories: **Internal Division Communication**, and **External Department-Wide Communication**

INTERNAL DIVISION COMMUNICATION

- Inputting and extracting information regarding projects within a user's division
- Tracking projects, Updating projects
- List View & Project Detail Page



There is no cookie cutter way a project is completed. Moped helps add clarity to projects increasing the efficiency of our team. For example, your role might change from project to project. You could reference Moped to figure that out.

THEME 1: USE CASE

INSIGHT

Moped serves as a tool for **passive communication**, enhancing transparency within TPW.

The majority of Moped's use cases fall under two main categories: **Internal Division Communication**, and **External Department-Wide Communication**

EXTERNAL DEPARTMENT-WIDE COMMUNICATION

- What other TPW projects might impact mine?
- What opportunities are there to coordinate with others in TPW? (*consolidate resources, work together, identify/avoid potential conflicts*)



I like that Moped has the potential to be a great aggregator across our programs. It can be a quick way to identify if a project is working in an area that my program is in. I can then identify who to talk to to begin that coordination process.

THEME 2: TOOLS AND FEATURES

INSIGHT

Moped's features are **employed differently** across divisions, roles, and personal preferences.

THEME 2: TOOLS AND FEATURES

INSIGHT

Moped's features are **employed differently** across divisions, roles, and personal preferences.



I'm pretty familiar with Austin's geography so finding projects on the map saves me lots of time



I'd much rather search for my projects through the list view because I know their project IDs



All my team's projects are labeled in a particular way so we can search them

THEME 2: TOOLS AND FEATURES

INSIGHT

Moped's features are **employed differently** across divisions, roles, and personal preferences.

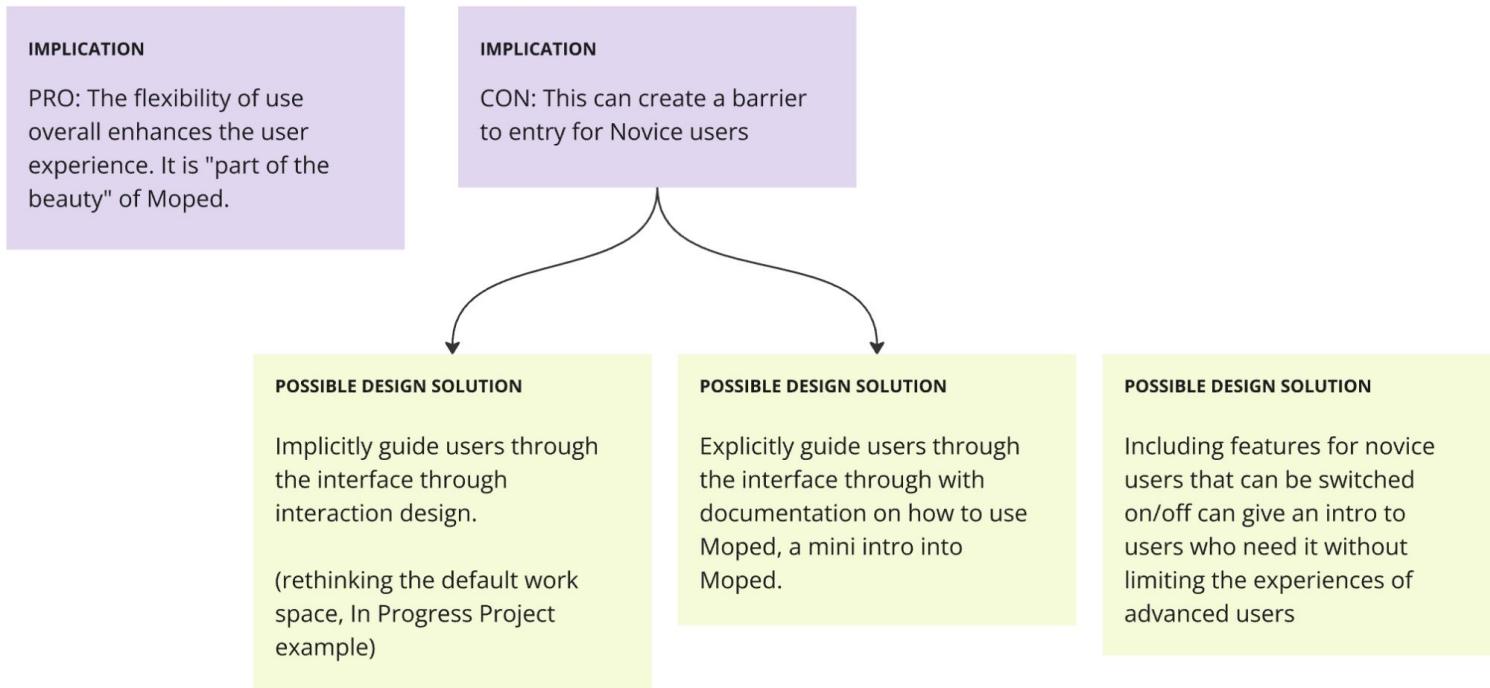


I wish I knew useful ways I could potentially use Moped, or how I could be doing things better.



I just want to jump in and get some data going, but I need more support navigating Moped. I'm still trying to figure out how to get that

THEME 2: TOOLS AND FEATURES



THEME 3: DATA QUALITY

INSIGHT

Moped becomes more valuable to TPW as **more groups** use it and contribute project data.

“

*Some groups have all of their data in Moped, for others Moped only shows a **small picture** of the data. I need to know where all of the data is, so I can pull it together for what I need.*

THEME 3: DATA QUALITY

INSIGHT

Moped becomes more valuable to TPW as **more groups** use it and contribute project data.

“

*I hope that once there's more clarity on how other teams are using it, it can be a **one-stop location** to see the other layers programs are sharing out to everyone*

THEME 4: THE MOPED MAP

INSIGHT

The Moped Map helps represent
Moped's location data **visually**



*Looking at the map after filtering to
find my project is much easier than
sorting through the same 71
projects in the list view*

THEME 4: THE MOPED MAP

INSIGHT

The Moped Map helps represent
Moped's location data **visually**



I may not know the name of every project that might overlap with [mine] so if I can pull up the map and easily see what overlaps with it, I can more quickly gain the information I need

THEME 4: THE MOPED MAP

INSIGHT

The Moped Map helps represent
Moped's location data **visually**



Having an idea based on a map to know where other divisions are at, or even just that there's another project near by would be helpful to extend coordination

Final Design Improvements

*How might we better integrate
the Moped Map into Moped by
enhancing the continuity and
comprehension of data across
various views?*

PAIN POINT 1: MAP TOGGLE

Dashboard Projects Staff

Search by ID, full name, description, phase, lead, sponsor, partners, eCAPRIS ID... Team contains Nathan Wilkes

Map DOWNLOAD

Columns

ID	Full name	Status	Lead	Sponsor	eCapris ID	Modified
1659	Walter Creek from Lake to 4th/Sabine_Trail	Construction	COA Watershed	COA ATD Active Transportation & Street Design	112861.002	8/10/2024
1699	Berkman Dr. from 51st St. to US 290_QuarterCent	Post-construction	COA ATD Active Transportation & Street Design	COA ATD Active Transportation & Street Design	112880.012	8/10/2024
1833	Manor Rd. from Dean Keeton St. to Springdale Rd.	Post-construction	COA ATD Active Transportation & Street Design	COA ATD Active Transportation & Street Design	112890.013	8/10/2024
1284	Stassney Ln. from Congress Ave. to West Gate Blvd.	Construction	COA ATD Active Transportation & Street Design	COA ATD Active Transportation & Street Design	112940.007	8/10/2024
2300	Escarpment Blvd. from William Cannon Dr. to SH-45	Post-construction	COA ATD Active Transportation & Street Design	COA ATD Active Transportation & Street Design	11280.014	8/9/2024
1842	Lake Austin Blvd. from MoPac Expy. to Enfield Rd.	Post-construction	COA ATD Active Transportation & Street Design	COA ATD Active Transportation & Street Design	112880.014	8/9/2024
1826	Congress St. S. from Live Oak St. to Williamson Creek	Post-construction	COA ATD Active Transportation & Street Design	COA ATD Active Transportation & Street Design	112880.014	8/9/2024

Rows per page: 100 - 1-100 of 271



Dashboard Projects Staff

Search by ID, full name, description, phase, lead, sponsor, partners, eCAPRIS ID... Team contains Nathan Wilkes

Map DOWNLOAD

A detailed map of the Austin area showing numerous green and blue lines representing transportation projects. The map includes labels for Barton Creek, Barton Hills, and various neighborhoods like West Lake Hills and Tarrytown. A legend in the bottom left corner shows symbols for 'Plan' and zoom controls.

Current Toggle from List View to Map View

PROCESS

- List View - Text-Based Representation
- Map Side Bar = List View Summarized
- Project Detail Page = List View detail Expanded
- Map View = Map Representation
- Component Map in Project Page = Map View detail Expanded with components from an isolated project

LIST VIEW

A screenshot of a web application interface showing a table with columns for ID, Name, Status, and Start Date. The rows represent different projects, each with a green status indicator.

ID	Name	Status	Start Date
P001	Infrastructure Project Phase 1	Green	2023-01-01
P002	Highway Upgrade Project 2	Green	2023-02-01
P003	Bridge Construction Project 3	Green	2023-03-01
P004	Water Treatment Plant Expansion Project 4	Green	2023-04-01
P005	Railroad Infrastructure Upgrade Project 5	Green	2023-05-01
P006	Seawall Reinforcement Project 6	Green	2023-06-01
P007	Landfill Remediation Project 7	Green	2023-07-01
P008	Public Transit System Upgrade Project 8	Green	2023-08-01
P009	Solar Farm Development Project 9	Green	2023-09-01
P010	Desalination Plant Construction Project 10	Green	2023-10-01

Side Bar
(when you select a project on the Map)

Project Detail Page: Summary

A screenshot of a project detail page for '12th St. from San Jacinto to Webberville Rd.' showing a map with a blue line indicating the project route and some green highlights. Below the map, there is descriptive text about the project's purpose and timeline.

Project Detail Page: Timeline

A screenshot of a sidebar titled 'Projects' showing a list of items with small icons next to them.

- 12th St. from San Jacinto to Webberville Rd.
- ...

MAP VIEW

A screenshot of a map view showing a detailed street layout. A specific project route is highlighted with a blue line and green shaded areas representing different components or phases of the project.

Component Map in Project View

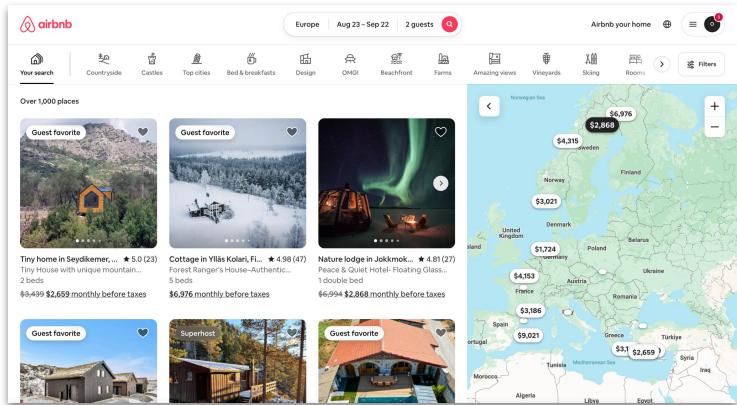
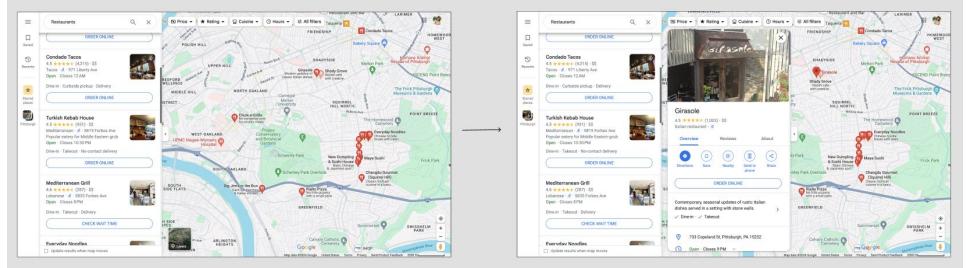
A screenshot of a component map in a project view, showing a map with a blue line and several green highlighted areas representing different project components.

A screenshot of another component map in a project view, showing a map with a blue line and several green highlighted areas representing different project components.

A screenshot of a third component map in a project view, showing a map with a blue line and several green highlighted areas representing different project components.

Breaking Moped down into its various representations of data

PROCESS



Exploring Common UI Patterns

SOLUTION 1: SPLIT VIEW

ID	Full name	Status	Lead	Sponsor	eCapris ID	Modified
1801	27th St. W from Nueces St. to Guadalupe St.	Complete	COA ATD Active Transportation & Street Design	-	11280.016	8/10/24
1496	Means Meadow Blvd. from Parkfield Dr. to Rutland Dr.	Ongoing	COA ATD Active Transportation & Street Design	-	-	8/10/24
1989	Far West Trail from Shoal Creek Blvd. to MoPac Expy.	Complete	City of Austin (COA)	-	-	8/10/24
14	East 7th Street / Shady Lane - AMD SIGNALS MODS INSPECTION/Creek Blvd. to MoPac Expy.	Planned	COA ATD Arterial Management	Private Developer	-	8/9/24
3592	Pedestrian 5th/7th Maintenance	In Progress	-	-	-	8/9/24
65	SCOFIELD RIDGE PKWY / HOWARD LN Traffic Signal	Under Construction	COA ATD Arterial Management	COA ATD Arterial Management	13238.0090	8/9/24
1003	Pedestrians from 6th to Webberville	Complete	COA ATD Active Transportation & Street Design	-	-	8/9/24
55	DESSAU RD and PEARL RETREAT/J LANE Traffic Signal	Under Construction	COA ATD Arterial Management	COA ATD Arterial Management	13238.010	8/9/24
290	William Cannon Drive / Sunstrip Drive & Lunar Drive: AMD SIGNAL INSPECTION	Complete	COA ATD Arterial Management	COA Corridor	11889.012	8/9/24
503	#912 South Congress Avenue - AMD-CAMPO-PHB CONSTRUCTION	Construction	COA ATD Arterial Management	COA ATD Arterial Management	12720.002	8/9/24

Animated Transition to Split View

SOLUTION 1: SPLIT VIEW

Dashboard Projects Staff

Search by ID, full name, description, phase, lead, sponsor, partners, eCapris ID...

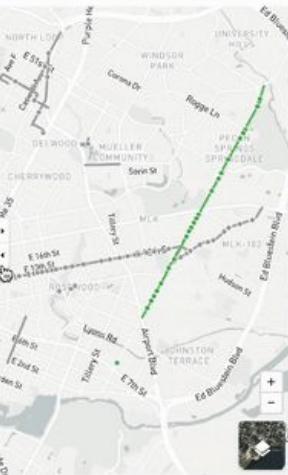
Matching all filters Team contains Nathan Wilkes Status is Construction

Map DOWNLOAD

ID Full name Status Lead Sponsor

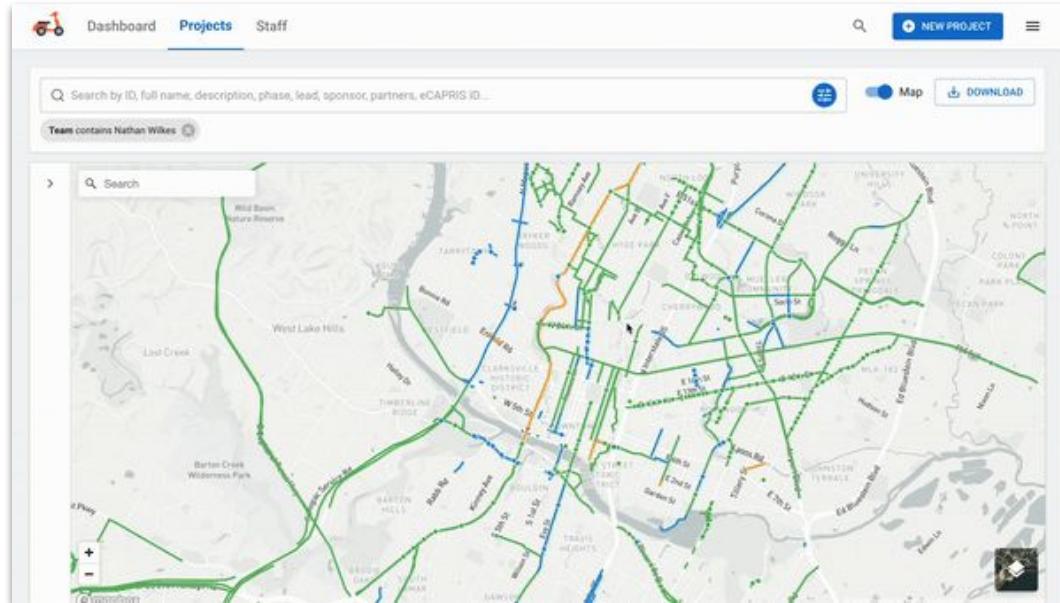
1659	Walter Creek from Lake to 4th/Sabine_Trail	Construction	COA Watershed
1003	Stassney Ln. from Congress Ave. to West Gate Blvd.	Construction	COA ATD Active Transportation & Street Design
1003	46th - 47th and Bennett Middle Fiserville Neighborhood Bikeways	Construction	COA ATD Active Transportation & Street Design
1003	Springdale Rd. from Airport Blvd to Manor Rd	Construction	COA ATD Active Transportation & Street Design
14	LBJ Corridor Bikeway from IH 35 to Onion St_Plaza Saltillo	Construction	Private Developer
1003	Rundberg Ln. from Mearns Meadow to Cameron Rd_SUP Project	Construction	COA ATD Active Transportation & Street Design
14	Anderson Mill Elementary - Graham Middle Phase 1	Construction	COA PWD Safe Routes to School
14	Chicon St. from Cesar Chavez to 11th St.	Construction	COA PWD Sidewalks & Special Projects
14	Kramer Ln. from Burnet Rd. to Lamar Blvd.	Construction	City of Austin (COA)

Rows per page: 10 < > 1 of 13



Customization of Split View with Carets

PAIN POINT 2: ISOLATING PROJECTS



Isolating a Project Through the Map

SOLUTION 2: MAP/LIST FEEDBACK

Dashboard Projects Staff

Search by ID, full name, description, phase, lead, sponsor, partners, eCapri ID...

Matching all filters Team contains Nathan Wilkes Status is Construction

Map DOWNLOAD

ID Full name Status

1659	Waller Creek from Lake to 4th/Sabine_Trail	Green
1003	Stassney Ln. from Congress Ave. to West Gate Blvd.	Green
1003	460 - 470 and Bennett Middle Fiserville Neighborhood Bikeways	Green
1003	Springdale Rd. from Airport Blvd to Manor Rd.	Green
14	LADJ Construction Bikeway from IH-35 to Union St./Plaza Saltillo	Green
1003	Rundberg Ln. from Mearns Meadow to Cameron Rd._SUP Project	Green
14	Anderson Mill Elementary - Graham Middle Phase 1	Green
14	Chicon St. from Cesar Chavez to 11th St.	Green
14	Kramer Ln. from Burnet Rd. to Lamar Blvd.	Green

Rows per page: 10 1-13 >

New Feedback for Isolating a Project on the Map

Impact & Takeaways

Impact

- Discovering the Moped map through design
- Enhancing data quality
- Improving the lives of Austin residents



Takeaways

- Good design isn't always noticeable
- Prioritizing impact
- Learning from a multidisciplinary team



THANK YOU & QUESTIONS

Thank you **COA DTS** ❤️ Patrick, Mike & everyone else + **CIF** 💙 Madison, Cassie, Yuyang & everyone else!

OTHER USABILITY INSIGHTS

- **Advanced Search/Search bars generally**
 - hierarchy & use
- **Saving Filters/Filtered Views**
 - A way to set/save/customize your default view/workspace
 - a way to save filters or filtered views
- **Tools for Novice Users**
 - Rethinking the Default Workspace
 - Mini Intro to Moped built into the interface
- **Legend on the Map/Better Symbology**
 - Legend/Key
 - Colors & Greys
- **Navigating the map is finicky**
 - confusion with location search/zoom
 - Isolating Projects
 - Hover Effect with Sidebar
- **Notifications/alerts**
 - notification if a project is in your area
 - feedback to as to if you are sure you want to repeat project
 - Reminder to keep projects up to date

BROADER INSIGHTS ABOUT MOPED

THEME 1

Use Case

INSIGHT

Moped's primary use cases are

- 1. Internal Division Communication**
- 2. External Department-Wide Communication**

THEME 2

Tools & Features

INSIGHT

Moped's features are **employed differently** across divisions, roles, and personal preferences.

THEME 3

Data Quality

INSIGHT

Moped becomes more valuable to TPW as **more groups** use it and contribute project data.