Rachel Tepper
2202 Enfield Rd. #200
Austin, Texas 78703

Mapping Mueller: A Post Occupancy Evaluation of Transportation Choices in A New Urbanist Community in Austin, Texas

rtepper@designworkshop.com
505-401-4359

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The 711-acre Mueller development is located just three miles northeast of downtown on the former site of the Robert Mueller Municipal Airport. Planned as a major transit-oriented development, Mueller contains a pattern of pedestrian and bike friendly streets to encourage a range of transportation options. Mueller is 30% complete and provides housing and jobs to over 3000 residents and 3000 employees. This study explores how residents, employees, and visitors use the bike lanes, sidewalks, and roads in the Mueller community. To evaluate the transportation infrastructure, the author designed and coded a custom Google Maps survey that asked residents to draw common routes, points of interest, and points of concern related to their transportation choices. This study investigates whether the transportation principles for the development are or are not achieved by comparing the expressed principles of the development with the behavior reported by users.

Introduction to the Problem

Mueller is a planned community located in Austin, Texas, just three miles northeast of downtown and is the former site of the Robert Mueller Municipal Airport. In 2006, McCann Adams, the master-planning firm for the 711-acre development, presented plans for the Market District – an 18-acre mixed-use center on the southeast corner of Berkman Drive and 51st street. The proposed district included residential mixed use, office, and a structured parking facility surrounding a major grocery store anchor. When asked for community input, current Mueller and surrounding neighborhood residents insisted on pedestrian and bicycle connectivity, commercial uses facing Berkman Drive, retention of trees, significant landscaping, and a site plan that allowed for future infill. However, interested supermarket chains insisted on a rear service entrance, visibility from major streets, ample surface parking, a gas station, and a drive-through pharmacy. It was clear from the multiple community meetings that residents opposed the gas station and the auto-oriented surface parking lot.

In the summer of 2013, the Mueller Market District opened with the major Texas supermarket chain, HEB, as the anchor. While the new HEB provides many amenities to Mueller and surrounding neighborhoods, it may also be an example of how market pressures can overpower community interests and urban design objectives. The new supermarket is set back from the street, has a single entrance that faces a large auto-oriented parking lot, and is surrounded by auto-oriented uses such as a gas station, a drive-through pharmacy, and a drive-through bank. A majority of future and current Mueller residents are within a ¼-mile walking radius of the new store, but very few design features on the site support pedestrian or bicycle transportation. The rear of the store lacks a southern entrance despite the fact that the majority of Mueller residents live south of the store. In addition, HEB constructed a 10-foot brick wall along the back of the lot, separating the rear of the store from future residential developments directly south of the District.

The transportation principles are essential to New Urbanist ideology and align directly with the twenty years of community plans and principles that precede the existing development. The example with HEB demonstrates that market pressures can outweigh the desires of residents and the ability for the Mueller development to achieve ambitious transportation goals.

Post-Occupancy Evaluation (POE) performed at the neighborhood scale can be a useful tool to evaluate New Urbanist communities to determine if they work for their residents, employees, and frequent visitors, and if they effectively achieve the goals of the planner and developer. This professional report is a POE of the current transportation infrastructure at Mueller. The goal is to determine whether the transportation infrastructure works the way the developer and planners intended, and establish lessons learned for the future phases of development. To conduct the POE, the author created an online participatory mapping survey that aims to understand how residents and visitors use the transportation infrastructure at Mueller and to test whether the designer's and developer's intentions align with the behavior of residents and frequent users. By learning what works and what doesn't, architects and planners can use this information to inform future design decisions.

GOALS OF THE RESEARCH

- To examine how residents, employees, and visitors use the roads, sidewalks, and bike lanes in the Mueller community.
- To investigate whether the transportation principles for the development are or are not achieved.
- To compare the transportation principles for the development with the actual behavior reported and exhibited by residents, employees and frequent visitors.
- To develop and test new digital mapping methods for evaluating travel behavior.
- To inform future development projects by revealing disconnects between the transportation planning, implementation, and actual effectiveness for residents, employees and frequent visitors.

To understand the success of a New Urbanist community, we must ask the people who live there, because only their actions and behavior can verify whether the design strategy works in the particular context – and perhaps, how it can be improved. This project aims to evaluate the efficacy of one case study, based on the local knowledge of residents and frequent users of the neighborhood. The research goal is to understand how residents and visitors use the transportation infrastructure at Mueller and to test whether the designers' and developers' intention matches up with the behaviors of residents. It is not meant to be a critique of New Urbanist ideology, but rather a proposal for New Urbanism to incorporate new methods of evaluation in the design process in order to stay effective and relevant. By learning what works and what doesn't, architects and planners can use this information in a feed-forward role.

Introduction to the Site

The 711-acre Mueller development is located in Austin, Texas, just three miles northeast of downtown on the former site of the Robert Mueller Municipal Airport. Austin is currently the 11th largest city in the United States, with a population of 859,814 and a five-county Metropolitan Statistical Area (MSA) of 1,915,039 (City of Austin Demographer, January 2014). Austin and the surrounding five county MSA have grown exponentially since the 1990s, and the population is expected to double to nearly four million by 2040. To mitigate the effects of this sprawl and to capture the future tax base for the region, Austin continues to focus efforts on urban growth and economic development strategies that support residential growth in central Austin. As a large city-owned property less than five miles from downtown, Mueller is a public-private redevelopment project that will provide a variety of housing, employment, recreation, and shopping opportunities that appeal to young families and others who might otherwise move to the surrounding suburbs.

Mueller is a New Urbanist community that specifically upholds the following transportation principles:

- *A Pattern of Pedestrian-Friendly Streets:* Mueller streets are designed to serve as an extension of the open space, pedestrian and bicycle network, and contribute to the community's sense of place and identity. The buildings create friendly, active edges while the roadways and streets are designed to distribute traffic in a way that minimizes the impact on adjacent communities. Homes are oriented towards the street with stoops and porches that encourage neighborliness.
- *Transit as a Viable Alternative to the Automobile:* Mueller is planned as one of Austin's major transit-oriented developments (TOD) with Capital Metro bus service and a proposed extension of the Capital Metro Rail system upon voter approval. The pattern and intensity of development is planned in conjunction with a comprehensive program of transit improvements aimed at reducing automobile dependence (Catellus, 2014).

As the lead developer of Mueller, Catellus estimates that the development is roughly 35% complete, containing 3,500 residents and 3,500 employees. The master plan calls for 5,700 residential units, 140 acres of park space, a mixed-use town center with abundant commercial space, on-site jobs, and convenient access to transit options (Catellus 2004). The master plan projects an eventual capacity of 13,000 residents and 13,000 employees.

In *The New Transit Town: Best Practices In Transit-Oriented Development,* authors Dittmar and Ohland state that there is a direct correlation between increasing densities and increased transit-service frequencies (Dittmar, 2004). The authors developed a typology that groups TODs by density levels and the correlated level of transit service. The typology ranges from >60 housing units per acre to >12 units per acre. The lower end is called a "Commuter Town Center" and the associated transit mode is peak period commuter service. Even at Mueller's full build-out, it will be lower than Dittmar and Ohland's "Commuter Town Center" which supports minimal transit service. The density of Mueller is restricted by a 2004 City of Austin Traffic Impact Analysis that limits Mueller's density due to the traffic impact that it could potentially have on Central Austin and the surrounding neighborhoods. To increase density numbers, Mueller will need high capacity transit, which is a decision that rests in the hands of City of Austin voters. Currently, it is difficult to convince voters of the need for transit in Mueller, when the neighborhood is not dense enough to actually support it.

Despite Mueller's limited transit capacity, it is designed with ample sidewalks, parks, walking trails, and innovative bike infrastructure. Mueller has a street connectivity of 66 intersections per 100 acres, compared to Austin's 19.7 intersections per 100 acres. Mueller also has close to 100% sidewalk coverage compared to Austin's 23% coverage.
While Mueller prioritizes alternative transit modes such as walking and biking within the development, the major transportation routes that connect Mueller to other areas of the city are primarily auto-oriented. The roads directly surrounding Mueller are large arterial streets and highways, which limits connectivity to adjacent neighborhoods. In addition, the phasing of the development creates a challenge for current residents impacted by construction disturbances and undeveloped infrastructure.

Methodology

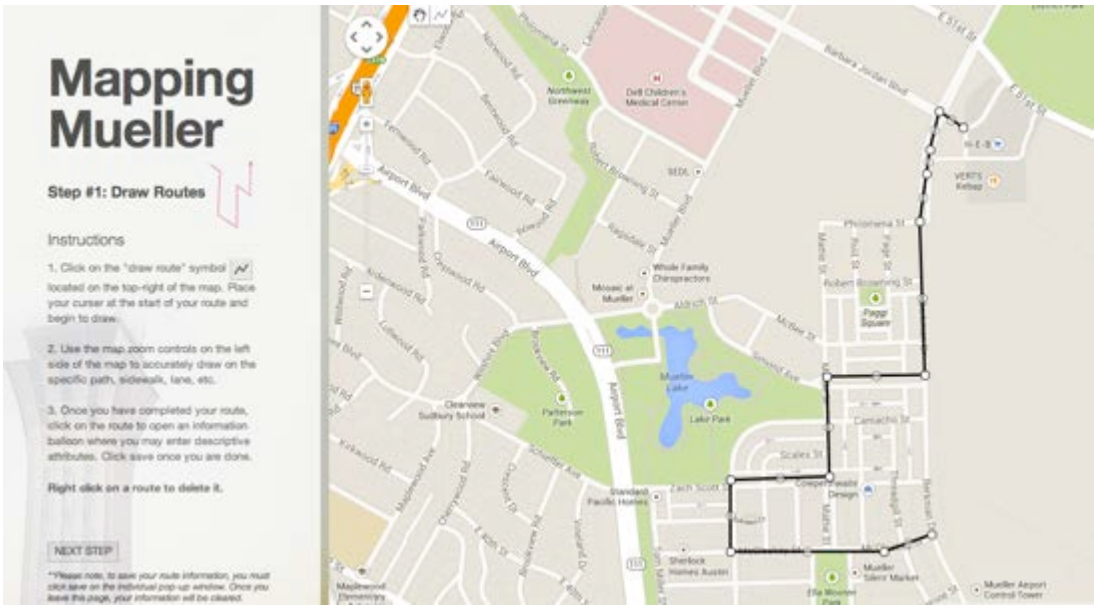

Figure 1: A screenshot of the interactive survey

An interactive online survey with a mapping component was created by the author and distributed to residents, nearby residents, and employees of Mueller. The intention of the survey was to gather local knowledge about route choices, points of concern, and points of interest.

The online survey contained three parts. The first part of the survey allowed respondents to manually enter in their commonly traveled routes and answer follow-up questions to indicate the mode of transportation, reason, frequency, companions, and route description. The second part of the survey asked users to identify places of concern or interest that impact their route choices. Respondents located points on the map, indicated whether they were a concern or interest, type of place, frequency, and description. The third step in the survey asked users to complete a list of demographic questions and open-ended comments related to user satisfaction and future recommendations.

SURVEY DESIGN

The survey was designed and coded using the Google Javascript API v3, a customized internet based programming language created by Google that allows web programmers to embed Google Maps into a webpage and access additional coding libraries to make more dynamic or complex online maps. In this case, the "Drawing Tools" library was used to embed drawing tools on the map so that website visitors could draw and save the data to a secure online database.

The survey stayed active from December 12, 2013, to February 14, 2014. During the two months, 85 people completed the survey. The survey respondents submitted 242 routes, 125 points of interest, and 84 points of concern.

Results and Conclusions

At the outset of this study, master planner Jim Adams expressed that despite Mueller's best efforts to reduce auto-dependency, living in Austin without a car is still very difficult. Mueller is engineering a density that the market is not yet ready for—and even though Mueller residents want greater density, market pressures prevent a dramatic transformation.

While this study represents a small slice of residents and visitors in the Mueller community, it does reveal that many residents walk or bike to points-of-interest locations within Mueller, especially to local parks. The survey also revealed that most respondents work outside of the development and use their vehicle to commute to work. While some residents walk or bike to the HEB Market District, many expressed frustration that the sidewalk infrastructure does not exist.

Based on the analysis of the Mapping Mueller data, Mueller is achieving its goals of encouraging pedestrian and bicycle transit—especially for leisure and exercise. However, the majorities of survey respondents still use vehicles for shopping and work routes and the majority of shopping and work destinations within Mueller are auto-oriented. Respondents pointed out opportunities to improve the safety and human comfort for pedestrians and bicyclists such as creating safer intersections and temporary sidewalks to connect major destinations until permanent solutions are in place. Respondents also suggested creative alternatives to vehicle use in Mueller such as a neighborhood shuttle service and improved city bus service. Mueller currently has a one transit stop on Aldrich and Mueller Blvd and one stop just outside the development on Manor and Airport, but only two respondents in the entire data set indicated using the bus system as a form of regular travel.

Based on the results of this survey, Mueller is not achieving its goal of being transit-oriented – only two out of 285 routes included bus travel. Mueller does have the right-of-way reserved for future urban rail expansion, but at this time the majority of survey respondents use vehicles for long distance travel. For the majority of residents in Mueller, the bus service is too far away for regular travel. As stated earlier in this paper, Mueller is not at the ideal density for a Transit Oriented Development, however, the ability to increase density is dependent on City of Austin voters decided that there is a need for increased transit service. Mueller should consider alternative strategies to rail that encourage transit ridership such as a more convenient bus stop location, a commuter bus, or a local shuttle.

NEXT STEPS FOR FUTURE RESEARCH

Mueller planners and developers should continue to examine how residents, employees, and visitors use the neighborhood's sidewalks, bike lanes, and road networks. Online participatory mapping platforms can be useful tools to gather feedback from Mueller community members. While automated GPS tracking systems like Map-My-Run and Garmin are becoming increasingly popular for gathering data about route preference, there are some benefits to having users map their own routes. Users filter the route data so that the information received is embedded with additional information such as route preference, route reason, and demographic characteristics. By asking users to think critically about where they prefer to run, walk, bike, or drive, researchers can engage users and allow them to become active participants in the planning process.

As New Urbanist design principles continue to guide neighborhood development, planners should seek out resident feedback early on in the design process. Mapping

Mueller is one example of how neighborhood post-occupancy evaluations conducted in the early phases of development can reveal areas of concern and opportunities for improvement, ensuring the places people live respond to residents' needs.

Appendix

The Mapping Mueller Survey can be accessed at www.mappingmueller.com. The following illustrations summarize some of the data received.

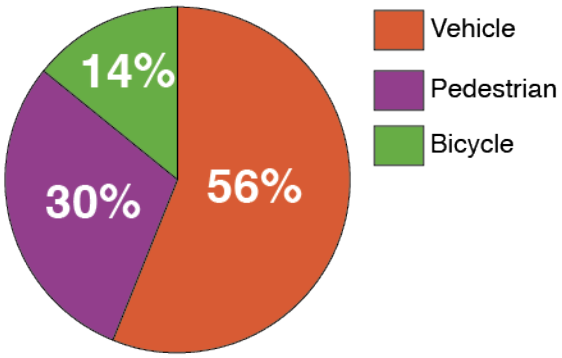

Figure 2: Mode Breakdown of Survey Transportation Routes

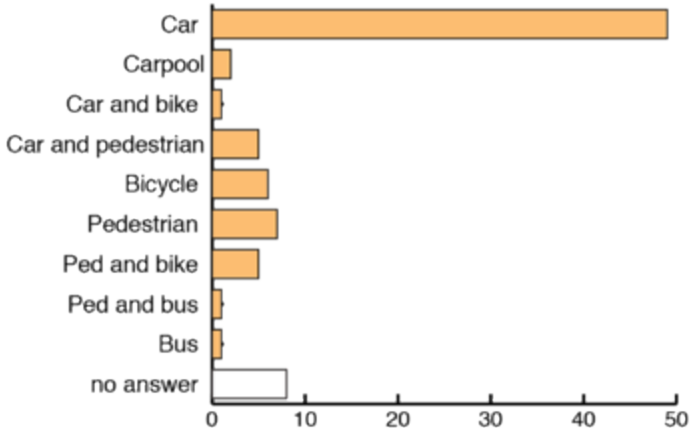

Figure 3: Respondent most frequent mode of transportation

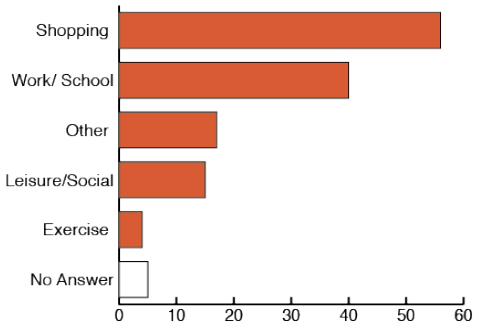

Figure 4: Vehicle Route Reason

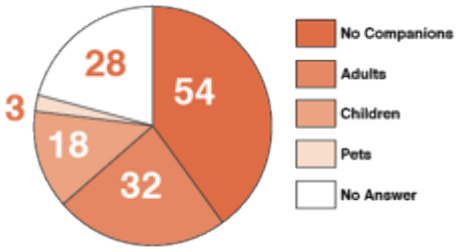

Figure 5: Vehicle Route Companion Type

Illustration 1: Vehicle Route Density

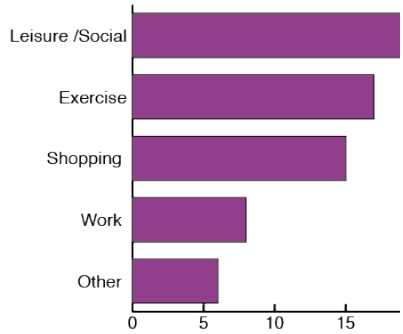

Figure 6: Pedestrian Route Reason

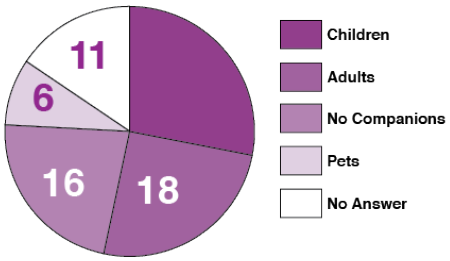

Figure 7: Pedestrian Route Companion Type

Illustration 2: Pedestrian Route Density

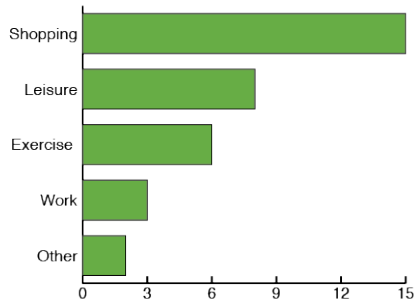

Figure 8: Bicycle Route Reason

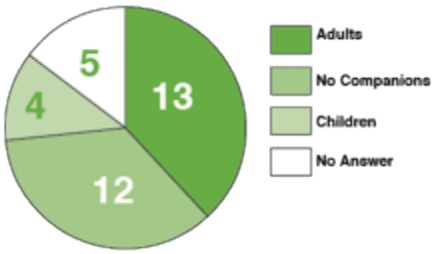

Figure 9: Bicycle Route Companions

Illustration 3: Bicycle Route Density

Illustration 4: Route Density Shopping

Illustration 5: Route Density: Leisure/Social

Illustration 6: Route Density: Work

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