Project Nomination
APA 2017 Technology Division Smart Cities Awards

Research Project + New Technology:
Scenario Tools for Equitable Corridor Reinvestment and Affordable Housing Preservation research project and the newly created Corridor Housing Preservation Tool

Nominee names

_The Corridor Housing Preservation Tool research team:_
Dr. Elizabeth J. Mueller, Associate Professor, University of Texas at Austin
Dr. Jennifer Minner, Assistant Professor, Cornell University
Thomas Hilde, Doctoral Candidate, University of Texas at Austin
Dr. Marla Torrado, recent graduate, University of Texas at Austin
Amanda Micklow, Doctoral Candidate, Cornell University
Alex Steinberger, Project Manager, Fregonese Associates
Research Partner: Lincoln Institute of Land Policy

Contact person

Elizabeth J. Mueller
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Executive summary

As fast growing cities attempt to channel growth to transit corridors, redevelopment has the potential to displace transit-dependent low-income renters. The Corridor Housing Preservation Tool was developed to enable local and regional governments to assess conditions along transit corridors and within neighborhoods and act strategically to preserve existing rental housing and to foster coordination among housing, transportation and other infrastructure investments. The metric allows for the comparison of corridors and neighborhoods in terms of the benefits that living in that location provides to low income renter households (in terms of access to jobs via transit), the scale of potential displacement (affordable units vulnerable to loss), and current development pressure. The Corridor Housing Preservation Tool is available for use through the open source scenario planning software, Envision Tomorrow (ET). The new tool uses publicly available datasets and integrates outputs from ArcGIS and Envision Tomorrow. It has been used to inform planning processes in Austin and San Antonio, Texas. Analysis has also been conducted for Denver and Portland, Oregon. The tool, related datasets, and training materials are now available to planners and university faculty and students at no cost.
January 3, 2017

Dr. Nader Afzalan
Mr. James Castañeda, AICP
Smart Cities Selection Committee
American Planning Association, Technology Division

Re: Technology Division Smart Cities Awards

Dear Dr. Afzalan, Mr. Castañeda, and members of the Smart Cities Selection Committee:

On behalf of a team of collaborating researchers, we would like to nominate the Scenario Tools for Equitable Corridor Reinvestment and Affordable Housing Preservation research project and more specifically, the newly created Corridor Housing Preservation Tool for a 2017 Smart Cities Award.

Nominees include the research team, which consists of researchers and planners from the University of Texas at Austin, Cornell University, and Fregonese Associates. The Lincoln Institute of Land Policy was a collaborating partner in this research. The development and testing of this tool was also supported with the generous brainpower of other faculty colleagues, planning practitioners, and graduate and undergraduate students who helped to develop, test, and deploy the tool.

We believe that equitable transit corridor planning and affordable housing are of utmost importance in planning Smart Cities. Without planning intelligence that takes into account the value of existing affordable housing stock and the benefits of transit access for low income populations, we cannot plan for sustainable cities or regions.

Thank you for your consideration. Please don’t hesitate to contact me with any follow up questions.

Sincerely,

Elizabeth Mueller, PhD
Associate Professor, Community and Regional Planning
University of Texas at Austin
Scenario Tools for Equitable Corridor Reinvestment and Affordable Housing Preservation research project - Corridor Housing Preservation Tool

Summary Description

Housing affordability is one of the most significant challenges in the rapidly growing metropolitan regions in the U.S. The Corridor Housing Preservation Tool is a freely available, open source tool, derived of a new and replicable methodology, and a training curriculum developed by researchers from the University of Texas at Austin, Fregonese Associates, and Cornell University. The tool was developed out of research funded through the U.S. Department of Housing and Urban Development and a contract with the Lincoln Institute of Land Policy. The new tool is intended to generate data for important policy discussions about equity and affordable housing within transit corridor, economic development, and redevelopment planning.

The Corridor Housing Preservation Tool was developed with rapidly developing and gentrifying metropolitan areas in mind, where existing housing units need to be carefully considered in the planning process. The new Corridor Housing Preservation Tool is a response to research that documents the negative impacts that the introduction of light rail transit and redevelopment plans can have on low income renters in central neighborhoods (Mueller, 2010; Rayle 2015; Pollack et al., 2011). The tool is intended to help incorporate preservation of existing affordable housing into housing, transportation, and economic development planning efforts. The tool provides a way to quantify and compare the value of the existing stock of affordable, rental housing units as part of these planning processes.

The Problem

As urban neighborhoods and transit corridors become more compact and connected, they also become desirable and increase in value. As a result, owners of aging rental properties are likely to sell or redevelop their properties. Rents are likely to rise or units may be converted to owner occupancy, and lower income households may be priced out. These results can contribute to the growing shortage of affordable rental housing in centrally-located and rapidly growing areas. The shortage of affordable rental units can undermine the ability of low income renters to rely on transit to commute to work or to needed services. Transit-dependent households displaced to areas where housing is more affordable will likely face a dramatic increase in their transportation costs—likely at the expense of other critical households needs.

Compounding this challenge is the fact that this aging—but unsubsidized—rental housing constitutes a stock of housing nearly three times the total amount of subsidized housing in the U.S. (Belsky & Drew, 2007; Joint Center for Housing Studies, 2012; Schmidt & Proppe, 2003) and typically serves as a city’s largest source of affordable housing. With fast rising land costs and shrinking public resources, replacing this stock with newly constructed affordable housing would take years and likely not replicate the transit access of the current stock. In contrast, rehabilitation of existing housing typically costs one-half to two-thirds as much as new construction and ensures ongoing access to transit networks (Brennan et al., 2013; Hickey, Lubell, Haas, & Morse, 2012).
**Indicators Built into the Corridor Housing Preservation Tool**

The Corridor Housing Preservation Tool addresses three key questions:

1. How much transit access to jobs does a corridor provide to low income residents?
2. How many affordable rental units are vulnerable to redevelopment?
3. How intense is the development pressure?

As users step through the use of the tool, they are prompted to gather background data to calculate the three metrics. By answering these questions, local governments can make informed decisions about where and how to focus efforts to provide and protect affordable housing.

Data required to run the tool is gathered from existing local and national data sources as well as several Envision Tomorrow modules. The training package, linked on the Envision Tomorrow website (http://envisiontomorrow.org), provides a step-by-step description of how to use the tool as well as a case study example exercise from the City of Austin, Texas.

**References**


Corridor Housing Preservation Tool
Technology and Method Deployment Details

The Corridor Housing Preservation Tool was initially tested in three metropolitan areas: Austin, Texas; Portland, Oregon, and Denver, Colorado. In testing the tool, the University of Texas at Austin research team consulted planners engaged in transit corridor development.

Working with Fregonese Associates and the UT-Austin team, researchers at Cornell University created a training package to be used in professional training sessions and in university planning courses. The training package provides step-by-step instructions and screenshots aimed not only at teaching the mechanics of using the Corridor Housing Preservation Tool, but helping professionals and students to grasp the value of affordable housing preservation and learn about national datasets such as the U.S. Department of Housing and Urban Development’s National Housing Preservation Database, the U.S. Environmental Protection Agencies’ Smart Location Database, as well as the American Community Survey (ACS). All of these important national datasets have been incorporated into the tool.

The Corridor Housing Preservation Tool can be downloaded along with an entire training package at http://envisiontomorrow.org/corridor-housing-preservation-tool. A geodatabase is packaged with the Corridor Housing Preservation Tool, which contains data (or attributes) from National Housing Preservation Database, Smart Location Database, and ACS. Integrating these databases into a single geodatabase saves planners steps in the analysis process. In addition, it means that the tool can be used in any U.S. metropolitan area represented in the national databases. A workbook was created to guide students and professional planners through the process and display the metric results.

The methodology, tool, and curriculum have been presented in numerous venues, including the annual meeting of the Association for Collegiate Schools of Planning, the San Antonio Housing Summit, and the City and Regional Futures Colloquium and Regional Science Research Seminar at Cornell University. It will also be presented by Alex Steinberger and Jennifer Minner at the 2017 APA National Planning conference. In addition, an article is under review for publication in a special issue of the peer reviewed journal Landscape and Urban Planning (LAND) on social equity and sprawl. The tool is also featured on the website of SPAN, the Scenario Planning Applications Network. SPAN is a network of tool developers, planning practitioners and academics who use and develop scenario planning tools. The Corridor Housing Preservation Tool and Curriculum has been added to the group’s online and freely available Curriculum Materials Library, which is accessed by planning educators and applications developers.

The Corridor Housing Preservation Tool is presently being deployed in San Antonio, Texas. Following closely on the adoption of SA Tomorrow, the City’s comprehensive plan, SA Tomorrow, SA Corridors is evaluating zoning and land use policy to prepare twelve of the city’s corridors for high capacity transit investment. The tool is being utilized to measure the potential impact of planned transit investments on the availability of housing for low income residents.

The City of San Antonio, in partnership with a team of national consultants, is using the Corridor Housing Preservation tool to measure each corridor’s access to low wage jobs, availability of
affordable housing, and development pressure. These metrics are being mapped alongside
detailed demographic data to assess the displacement risk posed by new transit and infrastructure
investments in each corridor. The following screenshots show outputs of the three indicators
built into the tool for corridors in San Antonio. (In this example, the demographic data are from
ESRI’s Tapestry dataset).

![Transit Access to Low Wage Jobs](image1)

![Development Pressure](image2)
The example from San Antonio, illustrates how the use of the methodology and tool can be transformative. The tool helps planners, policy-makers, and the public explore affordable housing and equity considerations in the planning process.

**How the Tool Works**

The Corridor Housing Preservation Tool consists of a stand-alone excel spreadsheet with macros that automate the calculation process and that provide tips within the analytical process. The spreadsheet is used along with ArcGIS and an Envision Tomorrow module called the Redevelopment Candidate App. Using a detailed workbook, planners and students can follow along to calculate metrics for Austin, Texas and then develop indicators in their own community.

A first step in the process is to identify transit corridors (or other types of districts) targeted for planning initiatives. These planning initiatives might take the form of economic development or transit plans that aim to spur redevelopment. In this step, planners are encouraged to engage with the public and decision-makers to identify areas that should be included in the analysis.

The next step is to calculate Indicator 1, which is used to quantify the transit access from each study area to the low and medium wage jobs residents are most likely to hold or need. This indicator measures the quality of life benefits for low-income renters within each study area. Access to jobs is of prime importance to working-age residents. This indicator focuses on accessibility from a corridor to low and medium wage jobs within a 45-minute transit trip. Data on job accessibility via transit was obtained from the U.S. Environmental Protection Agency’s Smart Location Database. This data has been incorporated into a shapefile with data for all block groups in the U.S. for use with the Corridor Housing Preservation Tool. The figure below is a screenshot of results for Indicator 1 along selected transit corridors in Austin.

Indicator 2 consists of an index of affordable housing vulnerability. Rental units that are not protected by federal subsidies may be vulnerable to demolition, redevelopment, or marketing to higher income groups, and are often unaccounted for in affordable housing inventory data. This indicator helps in calculating the density of affordable housing units along a transit corridor that may be vulnerable to such pressures.
To calculate Indicator 2, the workbook takes planners through steps to measure the number of rental units vulnerable to redevelopment per acre in each corridor. This is equal to the total estimated number of affordable rental housing units without protected subsidies or other means of preservation in each corridor. The data source for unprotected housing units comes from the American Community Survey 2010-2014 and the National Housing Preservation Database is used to estimate housing units with protective subsidies in place. The figure below shows a screenshot of the results of Indicator 2 for Austin.

A third indicator is a measurement of development pressure. To evaluate the development pressure for each study area, the percentage of multifamily land area predicted to redevelop in the next five years is multiplied by the current value of redevelopment activity, and then the value is divided by the area of the corridor to account for differences in size. This will result in a number that we can use to compare the study areas.

Envision Tomorrow’s Redevelopment Candidate App (a free open source module) is used in conjunction with ESRI’s ArcGIS software, to calculate the point at which a parcel can be considered a candidate for redevelopment. The screenshot below shows the output of Envision Tomorrow’s Redevelopment Candidate App in ArcGIS.

Next, geocoded building permit data is used to estimate the value of building activity within study areas. The Corridor Housing Tool spreadsheet calculates the intensity of development pressure. The result is an indicator of development pressure for each study area.
A planner using this new methodology and tool then examines the output within a metropolitan region. The intensity of development pressure can then be considered along with Indicators 1 and 2, which depict which study areas provide greatest access to low and medium wage jobs and which have the highest concentration of affordable rental units that are potentially vulnerable to redevelopment. A corridor with a larger number of affordable units that are unprotected, but where redevelopment pressure is low (measured in Indicator 3), may be a particularly good candidate for affordable housing preservation efforts that seek to stabilize and preserve existing rental units.

The result is indicators that are essential for equitable planning processes. They can inform important policy conversations and public participatory processes.
Corridor Housing Preservation Tool

Significance in Planning Discussion

Displacement through the loss of unprotected market rate affordable housing units through demolition and upgrading is a common threat to livability and equity within many rapidly growing communities. As a field, urban planning has recognized the value of preserving and enhancing community assets. Affordable housing units are among a community’s most important assets. This university-based project, in partnership with Fregonese Associates and Lincoln Institute of Land Policy, created a new tool and methodology for ensuring that the benefits of existing units are captured in transit, economic development, and other planning projects.

The new tool is already transforming planning practice in three main ways:

1. Fregonese Associates, which helped to develop the tool, has also adopted the tool in its planning practice, which spans neighborhood to regional scale planning across the country and around the world. The tool has already been adopted within San Antonio and is likely to be applied in other communities where the private consulting firm works. As a well-known consulting firm, the use of this tool is likely to encourage other consulting firms to adopt the tool and encourage communities that work with private consulting firms to expect similar analytics and indicators in their planning processes.

2. The tool is freely available on the web along with a detailed curriculum that can be used by planners, who can learn the tool on their own or in courses. The curriculum has been tested in a university setting and is freely available to educators interested in teaching students about affordable housing preservation, redevelopment planning, and about scenario planning tools. The tool is embedding concerns for affordable housing and equitable planning and also supplies a means of responding to these concerns within professional development and university curricula.

3. Local and regional planners and public officials can access the tool and curriculum to replicate the study for their own communities.

In addition to these expected results, we have found the following direct impacts:

- In Austin, analysis produced with the tool has fostered discussion of affordable housing preservation/production in neighborhoods adjacent to transit corridors. Currently, the city is considering adoption of its first Strategic Housing Plan. Council is presently in discussions about incorporating numeric housing goals for specific corridors into the plan. Such goals will be based on the analysis done with the Tool.

- In Austin, a coalition of groups concerned with planning goals that might be achieved through reshaping the city’s corridors (including transportation, public health, economic development and housing) has formed to develop a fund for use in preserving existing affordable rental housing in corridor neighborhoods. The Austin Community Investment Collaborative (ACIC) fund is set to make its first investment in early 2017.
January 4, 2017

Re: 2017 Smart Cities Award

To Whom It May Concern:

On behalf of HousingWorks Austin, I am pleased to provide this letter of support for Dr. Elizabeth J. Mueller’s Corridor Housing Preservation Tool. Preserving affordable rental homes near transit is crucial to addressing the affordable housing crisis. Loss of existing affordable rental units exacerbates displacement pressures on low-income households living in increasingly desirable transit-accessible neighborhoods.

The Corridor Housing Preservation Tool is both timely and practical. In 2014 the City of Austin adopted a comprehensive plan – Imagine Austin, which envisions a compact and connected city that focuses development in inter-connected activity centers and corridors. The City of Austin is poised to adopt a Strategic Housing Plan that will become an addendum to Imagine Austin. The Austin Strategic Housing Plan calls for an increase in housing supply and type, with a focus on low- and moderate-income households. Preservation of existing market affordable housing, rapidly dwindling under current market pressures, will be critical to increasing affordability. Dr. Mueller’s Corridor Housing Preservation Tool has helped focus current discussions of setting corridor housing goals.

In spring 2015, HousingWorks Austin launched the Austin Community Investment Collaborative (ACIC), which is a cross sector collaboration that unites leaders in real estate, affordable housing, public sector, and public transit around affordability. The ACIC is developing a private equity fund that will focus on the preservation of private market affordable multifamily rental housing. The goal is to acquire or develop approximately 10,000 units. The first property acquisition is slated to occur in first quarter 2017. The fund will be critical to the achievement of the city’s corridor goals.

Dr. Mueller’s work will guide ACIC’s investments in market affordable housing. The tool assesses corridors based on three dimensions: 1) current redevelopment pressures, 2) potential for loss of affordable rental units, and 3) benefit of the location to low wage workers. ACIC will utilize the Corridor Housing Preservation Tool as it considers and prioritizes investments in market affordable rental properties.

Thank you for your consideration of the Corridor Housing Preservation Tool. If you have any questions, I can be reached at (512) 454-1444.

Sincerely,

Mandy De Mayo
Executive Director
Additional Materials/Images/Illustrations/Video:

The training curriculum for the Tool can be downloaded as a zip file here: http://envisiontomorrow.org/corridor-housing-preservation-tool

Presentations made by Alex Steinberger, showing the use of the tool in San Antonio, and by Tom Hilde, as part of a workshop at Cornell University, can be found here: https://utexas.box.com/s/1n56gr23c3oer06npstbcupskguq5xw4

A video overview of the Tool can be found here: http://envisiontomorrow.org/corridor-housing-preservation-tool.

Maps depicting the results of our analysis are presented for Austin, Denver, and Portland on the following pages.
Corridor Housing Preservation Index: Austin, Texas

Part 1: Transit Access to Low-Wage Jobs

Part 2: Vulnerable Affordable Rental Housing

Part 3: Redevelopment Pressure & Timing
Corridor Housing Preservation Index: Denver, Colorado

Part 1: Transit Access to Low-Wage Jobs
- Lowest (0-2)
- Low (2-4)
- Medium (4-6)
- High (6-8)
- Highest (8-10)

Part 2: Vulnerable Affordable Rental Housing
- Lowest (0-2)
- Low (2-4)
- Medium (4-6)
- High (6-8)
- Highest (8-10)

Part 3: Redevelopment Pressure & Timing
- Lowest (0-2)
- Low (2-4)
- Medium (4-6)
- High (6-8)
- Highest (8-10)

Legend:
- West 38th Ave
- Federal
- Broadway
- Colfax West
- Colfax Central
- Colfax East

The University of Texas at Austin
Corridor Housing Preservation Index: Portland, Oregon

Part 1: Transit Access to Low-Wage Jobs
- Lowest (0.2)
- Low (2.4)
- Medium (4.6)
- High (6.8)
- Highest (8.10)

Part 2: Vulnerable Affordable Rental Housing
- Lowest (0.2)
- Low (2.4)
- Medium (4.6)
- High (6.8)
- Highest (8.10)

Part 3: Redevelopment Pressure & Timing
- Lowest (0.2)
- Low (2.4)
- Medium (4.6)
- High (6.8)
- Highest (8.10)