

# III. Building Affordable & Sustainable Communities through eTOD

## Contents

Introduction & Executive Summary .....	2
A. Preserving & Building Affordable Housing.....	6
1. Definition and Framing Considerations .....	6
2. Existing Conditions .....	8
a. Housing Costs as a Percentage of Income .....	8
b. Housing Property and Building Stock Condition .....	9
d. Unusual Housing Conditions .....	13
e. Geographically Based Incentives .....	15
f. Experienced Affordable Housing Developers and Supporters.....	15
3. Strategies for Affordable Housing Development & Maintenance .....	16
B. Sustainability in Community Development .....	19
1. Climate Conditions and Trends.....	19
a. Water Demand and Water Bills .....	19
b. Energy Demand and Energy Bills .....	20
c. Heat Stress and Air Pollution .....	20
2. Improve Physical Access to Transit Stations & Commercial Districts .....	20
a. Reduce heat stress and air pollution through buffer parks .....	20
b. Create Complete Streets to link residents and businesses to transit stations .....	22
3. Incentivize Resilient Building Techniques .....	23
a. Right-Size Parking.....	23
b. Energy and Water Efficiency .....	24
c. Renewable Energy.....	26
d. Critical Backup Systems .....	28

## Introduction & Executive Summary

Equitable Transit Oriented Development (eTOD) delivers the multiple benefits of TOD without displacement, creating more prosperous and sustainable communities that include current residents and small businesses. This paper on developing eTOD communities is the third in a series of five briefing papers on achieving eTOD in the South Central Avenue Light Rail Transit Corridor (LRT Corridor) of Phoenix. It has two basic functions:

- (1) To examine subjects essential to eTOD that are not covered in the other papers, principally:
  - Affordable housing development and retention
  - Sustainability in community infrastructure, buildings, and practices
- (2) To round out our understanding of eTOD in the Corridor by considering how the several types of development entailed in this process fit together in building a prosperous, affordable, and sustainable community

In regard to this paper's second function, it seems useful to provide a capsule summary of information and strategies from the other papers in this series, which are directly relevant to building eTOD communities in the Corridor, before providing a comparable high-level summary of information and strategies regarding affordable housing and sustainability. These are the key points from other papers:

- More than half of the households in the Corridor are burdened with housing plus transportation costs that consume more than half their income, and the median income renter household spends 28% of its income on transportation and 40% on housing. More than 90% of transportation costs stem from the ownership and operation of vehicles, with a Corridor-wide average of 1.23 vehicles per household and a norm of multiple vehicle ownership in 4 of the 7 Corridor station areas.
- Corridor residents now have transit access to tens of thousands of jobs within half an hour; the new LRT system will expand this access to thousands of additional jobs. The Corridor workforce is competitive in seeking paraprofessional and supporting positions in health care, business administration, manufacturing, and construction trades. Partnerships with workforce development organizations, including South Mountain Community College, will help more Corridor residents find such positions with transit-accessible employers and advance in their careers, building household revenues and wealth circulating in the Corridor.
- The LRT may also stimulate job-creating investments in industrial and infrastructure businesses, building construction, and professional services that might otherwise be located in downtown Phoenix, as well as existing retail and service businesses in the Corridor.
- With the LRT, Corridor residents can dramatically reduce their transportation expenses if they can commute and make most of their daily trips by transit or by walking within their communities, which allows them to reduce the number of autos they own.
- In all real estate property classes, parcels identified as vacant make up only 7% of all privately-owned acreage in the Corridor, but substantial amounts of additional property appear to be under-utilized (meaning that structures or other improvements to property have an assessed value that is less than 20% of the total assessed value of the property).

- Commercial properties in the Corridor have an alarming 20% vacancy rate, triggering an apparent need for a small business retention and support program in the Corridor.
- With the LRT, local businesses can reach an expanded, transit-served market, if they can establish anchor businesses in their station areas. They can also capture a more dedicated local market if (a) their station area commercial districts can provide a mix of goods and services that will meet the daily needs of residents within walking distance and residents within a two-mile radius who may arrive by bus or car (b) residential streets leading to LRT stations and station area commercial districts can be shaded and made walkable and bikeable in all seasons.
- To quickly and nimbly perform the critical function of tracking and, as necessary, taking control of vacant property to prevent blight and support land assembly for desirable commercial and residential projects, form a Corridor land bank as a not-for-profit organization.

Further key points are demonstrated in this paper:

- To adequately understand current housing stock as a starting point for planning affordable housing, several questions need to be answered with additional data:
  - Of the 1,571 acres in the Corridor zoned for housing (875 acres for multifamily and 696 for single family housing) only 72 acres (4.6%) are reported as vacant; however, considerable residential acreage appears to be under-utilized (meaning that structures or other improvements to property have an assessed value that is less than 20% of the total assessed value of the property). Additional data from Maricopa County, with an estimated cost of \$300, is needed to analyze assessor data and identify under-utilized property.
  - Of the 7,385 housing units in the Corridor, 37% are occupied by homeowners, 63% by tenants. The level of tenant occupancy indicates a strong need to plan for affordable housing focusing on the potential to retain and upgrade existing rental housing; however, we lack data on the physical condition of this housing. Valley Metro performed a windshield survey of housing to estimate risk of replacement as part of the successful application to fund the South Central LRT. Findings of the survey and any additional data on housing condition need to be analyzed.
  - Of the 2,745 housing units occupied by their by their owners, 33% have no mortgage. This could indicate a high level of financial security among homeowners or widespread inability to secure mortgage financing. This issue needs to be explored through interviews and possibly a survey.
  - Approximately 1,100 of the Corridor's housing units (15%) are mobile homes. Investigation including land and unit ownership analysis, site visits, and input from mobile home residents is needed to develop a creative plan for including mobile homes in an eTOD strategy.
- Although the Corridor will compete for investment with other Phoenix communities that have recently gained LRT service, the attraction of the LRT alone is likely to draw some residential investment to the Corridor. With improving station area commercial districts and residential streets, this attraction will be magnified. New housing investment can serve the interests of all current residents and small businesses in the Corridor to extent that the new development is led by for-profit developers committed to building mixed income housing and not-for-profit affordable housing developers that will also build mixed-income properties, with relatively high percentages of units guaranteed to be affordable.

- The Phoenix area has an experienced affordable housing community, led by the Sustainable Communities Coalition (SCC), with Raza Development and the Phoenix chapter of the Local Initiatives Support Coalition (LISC) as key members. SCC has been successful in creating a regional fund dedicated to sustainable (largely TOD) projects. Since 2011, The Sustainable Communities Fund has invested \$50M+ to leverage over \$300M in private investment for 25 equitable transit-oriented developments connected to 28 miles of light rail in Phoenix, Tempe and Mesa. These developments include over 2,500 mixed income (affordable, workforce, market) housing units and 200K+ square feet of commercial development with thriving health centers, and locally owned restaurants and retail establishments adding hundreds of employment opportunities to the Valley's light rail line. Engagement with SCC and its principal members is an early step in stimulating affordable transit-oriented housing in the Corridor.
- Although Phoenix does not have and is unlikely to have inclusionary zoning requirements, developers are offered incentives to establish guaranteed affordable housing in mixed use developments. Some for-profit developers have used these incentives in successful, mixed-income developments. Inquiries to assess the potential interest in the Corridor of these developers and their sources of financing should be part of the planning process for affordable housing development.
- Mixed-use development involving the integration of housing with commercial uses and services needed in the community such as technical education, health clinics, grocery stores, and day care have been elements of notably successful eTOD projects in middle and lower-income communities and have been executed by Phoenix affordable housing developers. Such mixed-use development may or may not require multi-story buildings and would be especially appropriate for the Corridor, facilitating the integration of housing with local commercial districts.
- Included in the process of affordable housing development are measures to ensure that housing guaranteed to be affordable upon first occupancy will remain affordable. The feasibility of establishing a land trust for this purpose should be included in initial development planning.
- As noted repeatedly in discussions of reducing transportation costs and establishing a market for local businesses, sustainable patterns of linking residents to transit stations and surrounding commercial districts through walkable streets is an essential requirement for eTOD. Meeting this requirement under the extreme weather conditions of Phoenix presents a challenge. However, it is a requirement that may be met through the scientific greening of streets with tree and other greenery planting, the use of heat reflecting materials, shade structures, and the creation of buffer parks. Design for such sustainable development will be consistent with Phoenix's Walkable Urban Code, Zoning Ordinance Chapter 13 and with the City's forthcoming Complete Street Policy and Design Guidelines. Securing adequate funding to systematically create walkable streets in the Corridor's eTOD community may require combinations public and private resources and a program of prioritization and phasing.
- Sustainability and resilience need to be built into the design and maintenance practices of residential and commercial buildings in the Corridor, as strategic measures to make these buildings affordable upon development and over the long-term. These measures include right-size parking to avoid allocating financed capital and land to unproductive paved surfaces, energy and water efficiency decisions in the design of building envelopes and systems, the cultivation of outdoor

plantings to manage and retain rain water as well as creating shade and cooling, and the education of residents in practices that will preserve their household budgets as well as the viability of residential developments. Sustainability in Phoenix communities may also include community-level solar installations, feeding into the grid and offsetting household and building energy costs.

- Public policies and programs described in Paper IV of this series can accelerate efforts to achieve affordable and sustainable development in the Corridor’s eTOD communities and help to ensure their success. Proposed policies and programs that would be particularly valuable in these ways include:
  - Formation of a Phoenix Land Bank that could use government authority to prevent blight from undermining development and provide a means of systematically tracking and supporting the affordable and sustainable redevelopment of vacant land, expanding the capacity of Corridor Land Bank, whose formation is recommended as a near-term action.
  - Establishment of neighborhood and corridor planning districts to give community residents an ongoing voice in the redevelopment of their communities
  - Authority to “develop by right” affordable housing—meaning projects are automatically approved if they meet defined standards or zoning, as opposed to being designated as conditional or special uses that require review—streamlining development that meets community objectives<sup>1</sup>
  - Strengthening affordable housing incentives to increase the flow of capital into mixed-income developments
  - A systematic policy regarding the use of federal Opportunity Zones (for which most of the area in the Corridor is designated) to ensure that this potentially powerful tool for amassing redevelopment capital does not generate displacement. This should be linked to systematic efforts to apply affordable housing support programs that have existed for some time
  - Establishing a property tax “Circuit Breaker” option as a safeguard against the pace of development spinning out of control and generating significant displacement
  - Exploring the creation of a Community Land Trust as a means of ensuring long-term affordability in the Corridor

This capsule summary of critical points regarding eTOD in the Corridor may illustrate how the several avenues of development entailed in this effort depend on and reinforce each other. The consequences of this inter-dependence are that difficulty in one area may impede the entire process, while successes in each area help to drive a virtuous cycle of equitable development:

- Investment in the South Central Avenue LRT has opened a range of equitable development opportunities for an area of Phoenix that includes several low-income communities and a sluggish economy south of the Central Business District.
- The Corridor and its supporters may respond to this opportunity by creating a workforce development program and support program for community business that would allow many

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<sup>1</sup> Karen Parolek. “How to Get By-Right Zoning Right,” American Planning Association, California Chapter, Los Angeles, May 8, 2017. <http://apalosangeles.org/how-to-get-by-right-zoning-right/>

Corridor residents to obtain better jobs, reduce their heavy transportation costs, and achieve a new level of financial security.

- This access to transit, new jobs, and local business will only occur if a concurrent program is launched to make community streets and public areas green and walkable.
- Improvements in community amenities and infrastructure will strengthen the attraction of the LRT, bringing new residential development to the community. These investments will add the momentum of more residents and wealth to improving community conditions, benefitting current residents if a large portion of the new housing is affordable and currently affordable housing is protected.
- Sustainable practices and community-empowering public policies can place the Corridor communities on a path of continuous, equitable improvement.

### **Method**

For the purposes of analysis in this paper and the others in this series, the Corridor is defined as a half-mile buffer around South Central Avenue, from its cross streets at Lincoln Avenue to Baseline Road. Where indicated, the one-mile buffer was also analyzed. The corridor and half-mile areas around each potential station were analyzed using [U.S. Census Bureau On the Map Longitudinal Employer-Household Dynamics \(LEHD\) Origin-Destination Employment Statistics \(LODES\) data](#) and a CNT internal tool that proportionally sums [U.S. Census Bureau American Community Survey 5-year data](#) across the block groups in each station area. Data from [CNT's Housing + Transportation \(H+T<sup>®</sup>\) Affordability Index, AllTransit<sup>™</sup>](#), and the [U.S. Department of Housing and Urban Development's Location Affordability Index](#) are also referenced in this series of papers.

To further develop the picture of eTOD challenges and potential in the Corridor, presented in these five briefing papers, CNT proposes to apply two analytical methods used in previous projects to:

- Identify specific areas within the Corridor that are particularly at risk for gentrification;
- Provide a quantitative estimate of the potential investment accruing in the Corridor as a result of eTOD.

## **A. Preserving & Building Affordable Housing**

### **1. Definition and Framing Considerations**

A substantial stock of affordable housing is an essential element of an eTOD community. Other features of eTOD – such as numerous connections to transit-accessible jobs, discounted transit cost options, and commercial and public amenities within the station area – contribute to the goals of widely shared prosperity and avoided displacement. But extensive affordable housing provides assurance that many residents can remain in a community as it improves through TOD, whether or not all the residents take advantage of the opportunities TOD creates.

The US Department of Housing and Urban Development (HUD) defines affordable housing as housing that a household can afford with no more than 30% of its income,<sup>2</sup> and the City of Phoenix has accepted this definition in its plan to further fair housing practices.<sup>3</sup> Most federal and state programs that provide affordable housing assistance set qualifications based on a recipient household's income as a percentage of Area Median Income (AMI). The beneficiary household pays no more than 30%, or a similar percentage, of its income for housing, and the public-sector subsidy provides the additional housing cost, up to certain limits. For example, the State of Arizona's Department of Housing, provides guidelines for levels of rent that it will support for households with income levels of 30% to 80% of AMI.<sup>4</sup>

While the percentage of income spent for housing is a crucial metric for affordable housing, there are other factors that must be considered in assessing whether or not housing conditions in a community are acceptable and desirable. Furthermore, the percentage of income that households in a community spend for housing is the result of market trends and development processes; the percentage, as such, tells us little about conditions that would challenge or favor an inclusive housing development process. When we examine existing conditions and propose strategies for improving affordable housing in an eTOD community, the following factors need to be considered:

- a) First and last, the number of housing units that are available to the community's households for approximately 30% of their income, with at least as many affordable units after community development as before
- b) Prevailing conditions of residential properties, availability of land and condition housing stock, both on a building-by-building basis and as properties set a standard and tone for the community
- c) The security of housing tenure -- the extent to which homeowners can meet the obligations of owning and maintaining property, and tenants can expect to continue living at their current address, or at least in their community, for as long as they choose to do so
- d) Housing conditions that are unusual when compared to conditions in most TOD communities,
- e) Whether or not geographically based public incentives ---such as Low-Income Housing Tax Credits (LIHTC) or federal Opportunity Zones (O-Zone) -- are available in the project area
- f) The potential for experienced affordable housing developers and to work in the area, along with organizations that support current owners in maintaining affordable housing
- g) The extent to which housing is connected -- within a short, safe, and pleasant walk -- to the commercial and public services households require for day-to-day living, including high-frequency public transit, so that households have a realistic opportunity to reduce their transportation costs by relying on transit and nearby amenities rather than car

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<sup>2</sup> US Department of Housing and Urban Development (HUD) current statement on affordable housing, [https://www.hud.gov/program\\_offices/comm\\_planning/affordablehousing/](https://www.hud.gov/program_offices/comm_planning/affordablehousing/)

<sup>3</sup> City of Phoenix, "Analysis of Impediments to Fair Housing Choice 2015-19" [https://www.phoenix.gov/nsdsite/Documents/nsd\\_rp\\_aitfh.pdf](https://www.phoenix.gov/nsdsite/Documents/nsd_rp_aitfh.pdf)

<sup>4</sup> Arizona Department of Housing, *2018 State Housing Fund and CBDG Program Median Income Guidelines*, <https://housing.az.gov/sites/default/files/documents/files/2018-State-Housing-Fund-and-CDBG-Program-Median-Income-Guidelines-Rev-5-14-2018..pdf>

- h) The burden of energy bills and water bills on residents and the prospect of retrofitting homes to achieve or maintain affordability for these essential services

In light of these considerations, the following section of this paper (A.2.) considers the extent to which housing in the South Central Avenue Corridor (the Corridor) is affordable today and likely to become more or less affordable based on current conditions and likely changes as the influence of the LRT takes hold. In light of these observations and the experiences of other cities, Section A.3. presents strategies through which substantial levels of affordable housing may be developed and preserved as a central component of eTOD in the Corridor.

## 2. Existing Conditions

### a. Housing Costs as a Percentage of Income

The following table summarizes data on the cost of housing as a percentage of income for renters and homeowners in the Corridor compared to the city of Phoenix as a whole.

**Table III.1 City & South Central Corridor Average Household (HH) Housing Costs**

Category	South Central Corridor	City of Phoenix	Corridor as a % City
<b>Average HH Income</b>			
Renters	\$ 21,336	\$ 37,144	57%
Homeowners	\$ 43,512	\$ 73,469	59%
<b>Average HH Housing Cost \$</b>			
Renters	\$ 8,474	\$ 14,368	59%
Homeowners	\$ 7,220	\$ 11,128	65%
<b>Average Housing Cost % of Income</b>			
Renters	40%	30%	--
Homeowners	17%	20%	--
<b>Number of Households</b>			
Renters	4,631	--	--
Homeowners	2,754	--	--

Sources: CNT Analysis, ACS 2012-2016 5-Year Estimates

These numbers confirm that the Corridor is a low-income area of the city of Phoenix. Average household incomes in the Corridor are only 55% of the city average for renters and 59% of the city average for homeowners. Average housing costs are also lower in the Corridor than in the city as a whole, although not in proportion to the differences in income. This can be seen clearly if we consider average housing cost as a percentage of average income. For the entire city of Phoenix, average rental costs are 30% of average rental household income, similar to HUD’s standard that a household should pay no more than 30% of its income for housing. For the Corridor, however, average rents are 40% of average renter household income, far above the HUD standard for acceptable housing costs. This concern is

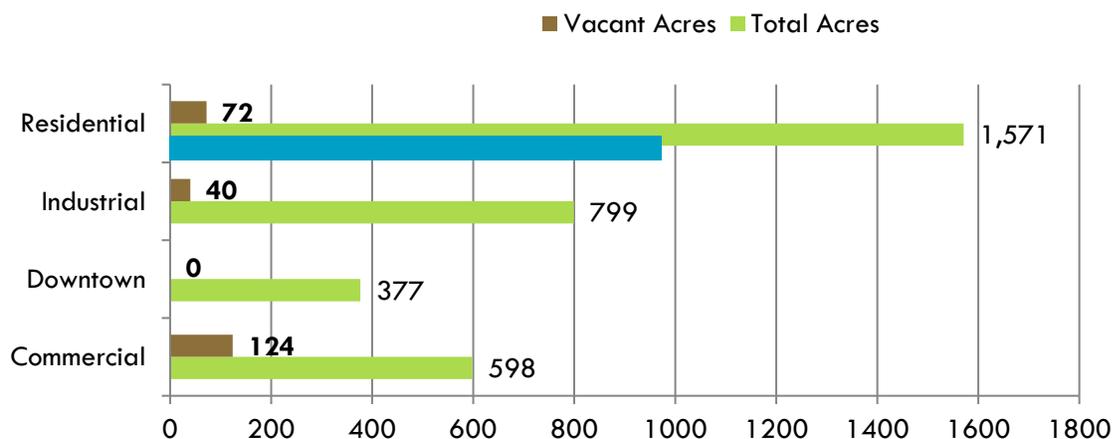
compounded by the number of rental households in the Corridor. The approximately 4,600 renter households in the Corridor comprise 68% of resident households. This large portion of the population, which is heavily burdened by transportation as well as housing costs, is at serious risk of displacement if rental costs rise closer to the city average. Their presence demonstrates a large need for affordable housing.

In contrast to renters, the average Corridor homeowner pays only 17% of income for housing, far less than the HUD standard and less than the 20% on a higher level of income paid by the average homeowner in Phoenix. However, this lower housing cost of homeowners in the Corridor reflects a high percentage of owner-occupied units for which there is no mortgage. The absence of mortgages on so many homes may indicate an advantage or a problem, as discussed in Section III.A.2.d of this paper.

### b. Housing Property and Building Stock Condition

Extensive land is available for housing in the Corridor. The Corridor contains 1,571 acres zoned for housing, 875 acres for multi-family housing and 696 acres for single-family homes. With such acreage, housing properties are not densely developed. Overall housing density is 4.7 households per acre of residential land, 5.3 households per acre in multi-family zoned land, and 4.0 households per acre in areas zoned for single-family homes.

**Chart III.1. Acreage by Land Use in the South Central Corridor**



Sources: City of Phoenix Data Portal, Coordinate Reference System (CRS) EPSG 2223, NAD 83/Arizona Central, Maricopa County Assessor’s Office

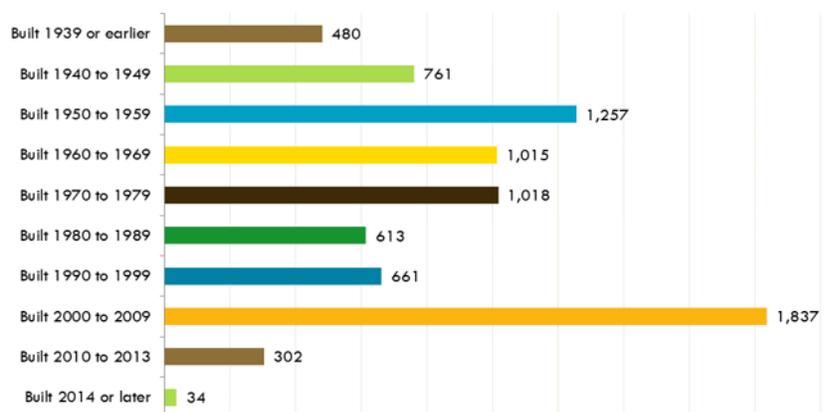
Given these low densities, it is surprising that only 72 acres (4.6% of all land zoned for housing) is classified as vacant. General impressions from satellite views of the Corridor are consistent with the data showing low density on residentially zoned land. It is likely that much of the Corridor’s residential land is under-utilized (meaning that structures or other improvements to property have an assessed value that is less than 20% of the total assessed value of the property).<sup>5</sup> CNT is awaiting data from Maricopa County that will allow us to test this hypothesis.

<sup>5</sup> CMAP, Annie Byrne, Jieun Kim, Lindsay Banks, Matthew Stratton, “Overview of Snapshot Report on Urban Infill Development”, a Power Point presentation to CMAP’s Land Use Committee 9/19/2007

These low levels of residential density and likely high levels of under-utilization carry mixed implications for the risk of displacement. On one hand, property values are likely to rise as TOD occurs and land is used more intensively. At the same time, low density indicates that ample land is available for affordable housing development. Especially if affordable housing developers can act quickly to launch projects before the LRT stimulates a rise in property values, under-utilized land in the Corridor could contribute to population retention. One certain implication of the Corridor’s low housing density is that the extent and causes of under-utilized land need to be understood, and under-utilized land needs to be identified and tracked in any comprehensive development strategy for the Corridor.

The condition of housing stock in the Corridor is generally not well understood, and the information that is available indicates widespread deterioration. However, one factor that does not appear to be a major cause of concern for most of the Corridor is the age of the Corridor’s residential buildings. While the Corridor includes some historic buildings, only 6% of its housing stock was built before 1939. Approximately 38% was built between 1940 and 1969; 29% was developed between 1970 and 1999; and 27% has been constructed since the Year 2000, as indicated in the following chart.

**Chart III.2. Age of Housing Stock in the South Central Corridor**



Sources: ACS 5-Year Estimates 2016, QGIS NAD 83 Arizona Central EPGS 2223.

CNT has not found any study of housing conditions for the entire Corridor, as a distinctively defined area, prior to the application for the federal funding that is enabling construction of the Central Avenue LRT. A number of studies of conditions for workforce and affordable housing at the state and regional levels were conducted between the Years 2000 to 2006, but these projects did not focus on the Corridor as a study area.<sup>6</sup> More than ten years ago the City of Phoenix Planning Department conducted two area

[http://www.cmap.illinois.gov/documents/10180/35654/2007-10-17\\_snapshot\\_report\\_infill.pdf/256aaebf-c9a2-48bb-aea0-5f574ccd9d32](http://www.cmap.illinois.gov/documents/10180/35654/2007-10-17_snapshot_report_infill.pdf/256aaebf-c9a2-48bb-aea0-5f574ccd9d32)

<sup>6</sup> Arizona State University, *Affordable/Workforce Housing Recommendations and Barriers in Arizona and Metro Phoenix, 2001 to 2007*, Commissioned by LISC Phoenix and the Arizona Community Foundation, August 2008, <http://www.liscphoenix.org/wp-content/uploads/2015/10/Affordable-Workforce-Housing-Recommendations-Barriers.pdf>

planning studies that examined portions of the Corridor along with adjacent areas that lie outside of the Corridor; both of these studies documented conditions of widespread housing deterioration:

- The 2001 study of “South Phoenix Village” examined an area that included portions of the Broadway, Roeser, and Southern Avenue station areas, along with other land to the east of the Corridor. In this study City inspectors examined a large sample of buildings and classified them into four categories. They rated over a third of the buildings into the two lowest categories: 24% as “Major Repair Required” and 18% as “Major Rehabilitation Required or Not Feasible”.<sup>7</sup>
- The 2004 plan for “Central City South” studied an area bounded by Central Avenue on the east; it included the western portions of the station areas of Lincoln, Buckeye, and Audubon and land further to the west. This plan noted that overcrowding was three times more prevalent in this area than in the city as a whole. It also cited a 1994 housing condition survey with broad findings that 10 to 50% of the housing needed major repair, while 5 to 25% was not feasible to repair, and declared that little improvement in the housing stock occurred between 1994 and 2004.<sup>8</sup>

Since the study areas of these plans only overlap the Corridor and since they are more than ten years old, they are only an indication of poor housing conditions in the Corridor, but the conditions they indicate are severely negative.

In the first paper of this series, CNT noted that as part of the “Alternatives Analysis” leading to the award of federal funding for the South Central Corridor LRT, Valley Metro staff conducted a windshield survey of property conditions in the Corridor’s station areas to determine its “Redevelopment Susceptibility”. Properties were rated on a four-point scale which included:

- “Moderate susceptibility to change: Includes partially vacated or deteriorated parcels/buildings, and lots marginally used.”
- “High susceptibility to change: Includes vacant, underutilized or deteriorated parcels/buildings.”<sup>9</sup>

The survey categorized large parts of the Buckeye, Audubon, Broadway, and Roeser station areas as in Moderate or High Susceptibility, and some sections of every station area in both of these conditions. This pattern is illustrated in the map on the following page.

CNT has requested the data that underlies this map, so that a more quantitative assessment of housing conditions in the Corridor can be made. However, existing information indicates that much of the housing in the Corridor is in very poor condition.

Communities with poor housing stock are especially susceptible to displacement, as the terminology of the analysis required by the Federal Transit Agency indicates. Residents moving into an area to benefit from its transit service will not accept substandard housing. Development pressure will lead to new

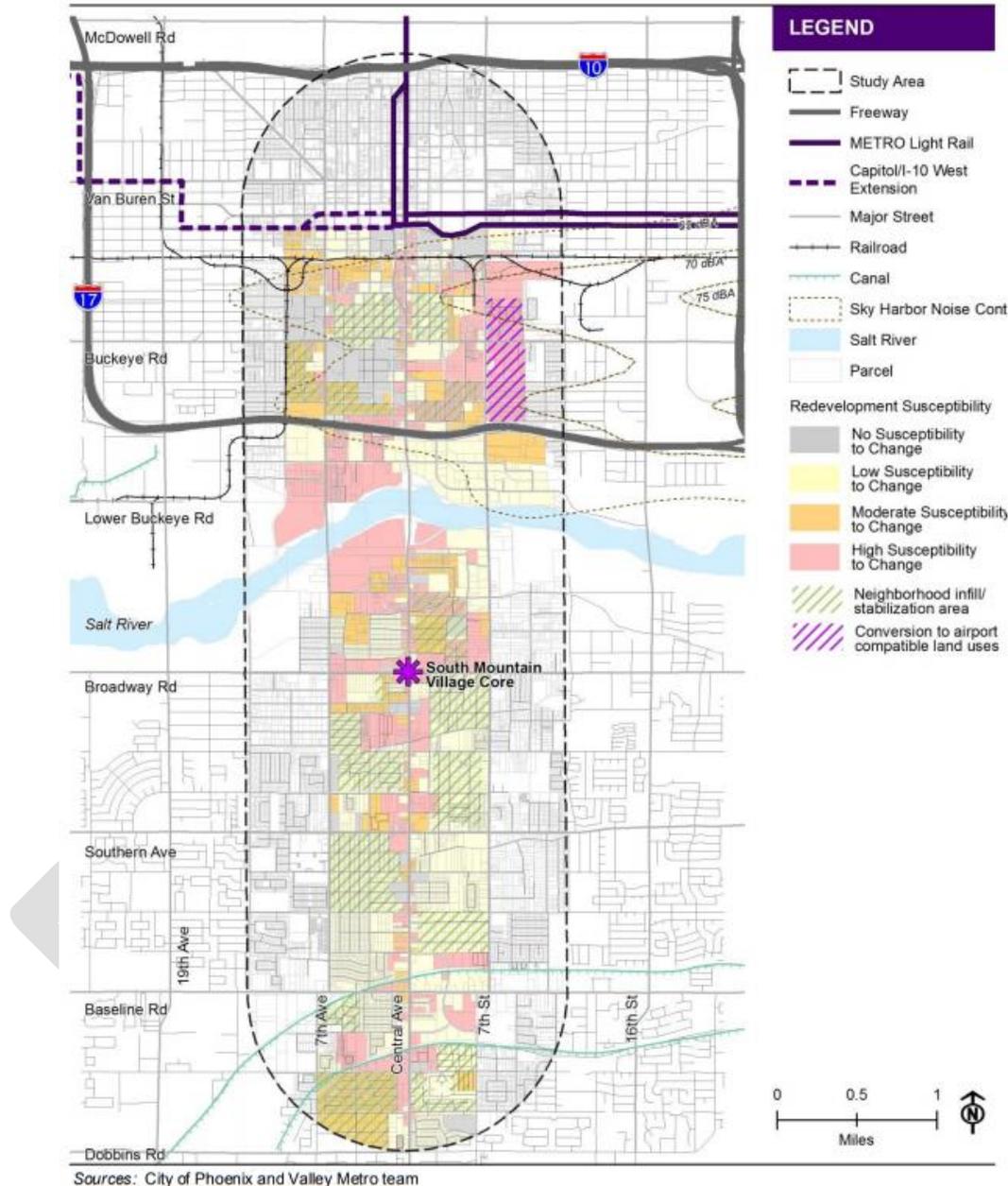
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<sup>7</sup> City of Phoenix Planning Department, “South Phoenix Village Redevelopment Area Plan”, pages 8 -12, 2001, [https://www.phoenix.gov/villagessite/Documents/pdd\\_pz\\_pdf\\_00148.pdf](https://www.phoenix.gov/villagessite/Documents/pdd_pz_pdf_00148.pdf)

<sup>8</sup> City of Phoenix Planning Department, “Central City Area Plan”, pages 15 – 17, June 2004, [https://www.phoenix.gov/villagessite/Documents/pdd\\_pz\\_pdf\\_00050.pdf](https://www.phoenix.gov/villagessite/Documents/pdd_pz_pdf_00050.pdf)

<sup>9</sup> Valley Metro, Alternatives Analyses, South Central Corridor, Locally Preferred Alternative Report, Redevelopment Susceptibility, pages 13-15, April 2014

construction and basic building rehabilitation from which lower income residents will be excluded unless strong measures to ensure affordable housing are implemented.



**Map III.1.** Alternatives Analysis, South Central Corridor, Locally Preferred Alternative Report, Redevelopment Susceptibility, Pages 13-15, April 2014

c. Security of Housing Tenure

We have noted in the introductory paper of this series that nearly two thirds of Corridor households are tenants rather than homeowners.<sup>10</sup> For obvious reasons, renters in improving neighborhoods are generally at greater risk of displacement than homeowners. While homeowners are likely to realize

<sup>10</sup> ACS 2012-16 5-Year Estimates

rising asset values in a redeveloping community, renters will probably receive only higher rents. Tenants in buildings that undergo thorough rehabilitation in response to market opportunities are commonly moved out during the reconstruction and unable to find rental units of comparable value in the same community. The current average annual housing unit rent in the Corridor is only \$8,474 compared to a city average of \$14,368; yet rent requires 40% of the average Corridor tenant's income<sup>11</sup>; so, if rent levels rise to a level closer to the city average, the average tenant will be unable afford the higher rent.

Also, as noted in the preceding section, prevailing housing conditions in the Corridor often demonstrate a need for thorough rehabilitation, so building rehabilitation or replacement could become a common event that displaces renters from the Corridor. Accordingly, renters are at high risk for displacement and have an urgent need for housing rehabilitation and construction that will ensure the provision of affordable housing. The process of rehabilitation and resulting displacement can occur long before a transit line is operational as landlords anticipate the coming demand of renters seeking to locate near transit service. Therefore, strategies to staunch displacement must start early.

While homeowners are generally in a better position to deal with and benefit from community redevelopment than tenants, redevelopment can still affect them adversely and possibly lead to their displacement. Data provides ambiguous indications regarding the typical Corridor homeowner's capacity to deal with higher housing costs. On one hand the average median homeowner household in the Corridor has an annual income of only \$43,512, compared to an income of \$73,469 for the average homeowner household in the city of Phoenix; so, to the extent that the average Corridor homeowner household takes on additional expense its potential to meet basic needs is challenged. On the other hand, the average Corridor homeowner household now has a housing expense that is just over half of the city average and only 17% of its income; these figures suggest a capacity to handle more expense. However, the average Corridor homeowner's low housing costs stems largely from the fact half of Corridor homeowners have no mortgage, a situation that could indicate either deep financial capacity or acute need.

#### d. Unusual Housing Conditions

Two situations distinguish housing conditions in the Corridor from conditions in many other urban communities: an unusually high percentage of owner-occupied housing units that have no mortgage and a high incidence of mobile homes.

##### i) High Percentage of Owner-Occupied Housing Units That Have No Mortgage

Within the Corridor, approximately 49% of owner-occupied housing units do not have mortgages, compared to the city of Phoenix as a whole, in which 27.6% of owner-occupied housing units do not have a mortgage and 30% in the Phoenix metropolitan area, and 35.9% nationally.<sup>12</sup> This high

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<sup>11</sup> Ibid

<sup>12</sup> ACS 2012-16 5-Year Estimates

percentage of owner-occupied homes without mortgages could have a number of causes, several of which might apply to the same housing unit:

- Households with the resources to buy a home without a mortgage may simply have found a good deal in the Corridor, purchased and settled here. Any households who have come by their homes in this way would be in little danger for displacement; however, the average low income of Corridor homeowners indicates that such purchases have not been common.
- Given the attraction of Phoenix to households in retirement, some home purchases may have been made by retired persons who have used equity from the sale of properties or savings to buy a modest home in this city without financing. However, if this was a common pattern, we would expect to see percentages of mortgage-less, owner-occupied homes that were higher in Phoenix than most other US cities and regions, which is not the case.
- The relatively low average income of Corridor homeowners indicates that purchases of homes have usually been made by people of modest income who have saved and/or received family support to become homeowners without mortgages. Some may have inherited their homes. The continuity of a majority Hispanic population in the Corridor over several decades supports this explanation. Homeowners who have acquired their properties in these ways may not be able to obtain a mortgage for home improvements or to withstand steep rises in property taxes, even if they have growing equity.

The causes of the Corridor's high percentage of homeownership without mortgages would need to be determined by a study of public records of property transactions and possibly by interviewing a representative number of homeowners. Such a study would inform specific efforts to protect low-income homeowners from displacement. However, current information indicates that many homeowners in the Corridor will require some form of public sector support to maintain and improve their homes as a higher neighborhood standard of property maintenance is set and property taxes rise.

ii) High Incidence of Mobile Homes

Approximately 1,100 housing units in the Corridor, roughly 15% of the Corridor's housing stock, are mobile homes.<sup>13</sup> The presence of so many mobile homes within the boundaries of a major city is unusual, and some cities discourage or simply forbid the presence of mobile homes as substandard housing. But a strong case can be made for the inclusion of mobile homes as affordable housing in communities that lack high residential density with many residents at risk of displacement from new development.

- Mobile homes have a reputation of being shoddily built and environmentally unsound, but the grounds for this perception are based largely on models produced before 1980. The present generation of mobile homes are comparable in quality to site built housing, as evidenced by data showing that the value of mobile homes now appreciates at approximately the same rate as site-built homes.<sup>14</sup>

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<sup>13</sup> ACS 2012-16 5-Year Estimates

<sup>14</sup> Laurie Goodman, et al, *New Evidence Shows Manufactured Homes Appreciate as Well as Site-Built Homes*, Urban Wire, Housing and Housing Finance, Urban Institute <http://www.jchs.harvard.edu/urbanist-case-trailer-parks>

- Mobile homes are inherently less expensive than site-built housing because the units are mass produced with standardized materials and processes, and these economies translate into a lower cost of occupancy. In America’s 100 largest urban areas, the average cost of occupancy for mobile homes was 40.5% less than comparable site built housing units.<sup>15</sup>
- Mobile homes can support relatively high density, a desirable characteristic in TOD areas. While moderate-height apartment buildings of 2 to 4 stories will provide higher residential density than a mobile home park, mobile units require considerably less space than single-family homes. Typical lot sizes for mobile homes range from 960 to 3,600 square feet, while a typical lot size for a single family home is 8,000 square feet.<sup>16</sup>
- Finally, 71% of mobile home units are owned by their occupants; so, for any affordable housing strategy that involves resident control or ownership, mobile homes would support such an initiative at least as readily as conventional apartment buildings.<sup>17</sup>

For these reasons, the mobile homes in the Corridor should not be viewed, per se, as an impediment to the preservation of affordable housing and eTOD, although the quality of these units and their terms of occupancy should be studied. The Corridor’s mobile home parks may even provide a testing ground for eTOD strategies that involve establishing safe and sustainable walking conditions and securing affordable housing through resident ownership and alternative financial models, such as cooperatives or land trusts.

#### e. Geographically Based Incentives

The Appendix of paper V of this series presents a map of Opportunity Zone (O-Zone) and New Market Tax Credit areas in the Corridor. It also discusses the existing Low Income Tax Credit properties in the area. The vast majority of the Corridor is covered by O-Zone designations. These particular incentives create opportunities to attract investment to the area but may also create additional gentrification pressure that should be addressed with eTOD policies and initiatives.

#### f. Experienced Affordable Housing Developers and Supporters

Phoenix is served by the Sustainable Communities Collaborative, a partnership of more than thirty-five organizations among which leading partners are the Raza Development Fund (RDF) and the Local Initiatives Support Corporation (LISC). The Sustainable Communities Collaborative grew from the Sustainable Communities fund launched by LISC and RDF in 2011, which provided \$20 Million in seed projects in areas which may be considered too risky to attract private development. In 2015, RDF and

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<sup>15</sup> Nolan Gray, “The Urbanist Case for Trailer Parks”, City Lab, July 26, 2018  
<https://www.citylab.com/equity/2018/07/the-urbanist-case-for-trailer-parks/566123/>

<sup>16</sup> Ibid

<sup>17</sup> Ibid

LISC invested \$30 Million in a revolving loan fund for developing mixed-income housing in the transit corridor.

The Sustainable Communities Collaborative has helped finance approximately \$150 Million in projects along Phoenix's light-rail corridor, including more than 2,000 housing units, 200,000 square feet of commercial space, a community medical clinic. In the South Central Corridor, the Union at Roosevelt, an affordable housing complex, has been developed by LISC.

The organizations comprising the Sustainable Communities Collaborative should be consulted to plan and advance any housing and commercial development initiatives in the eTOD. Local affordable housing developers should be surveyed to identify organizational capacity needs, common barriers to affordable housing initiatives, recommendations for financing tools and land use planning, and specific recommendations for development in the eTOD.

Market-rate developers can also become partners in advancing affordable housing. Nationwide, some successful private housing developers are building projects in which they voluntarily include a percentage of units guaranteed to be affordable for low-to-medium income working households rather than being priced according to market demand. In other areas, local ordinances require a certain set aside of affordable housing units, as part of any new housing development (see Paper IV).

### 3. Strategies for Affordable Housing Development & Maintenance

In this section we outline a series of strategies to preserve existing and create new affordable housing considering the existing conditions described above.

- a. Establish an Affordable Housing development team that will take responsibility and perform the tasks involved in planning and implementing an affordable housing strategy for the South Central Corridor. Include:
  - 1) City and County development staff and Valley Metro staff
  - 2) Community-based organizations of the Corridor engaged in advocacy and development
  - 3) Experienced affordable housing developers, members of the Sustainable Communities Collaborative, optimally including Phoenix LISC and Raza
  - 4) Trellis housing counselling and financing organization
- b. Develop and maintain actionable information on Corridor property conditions
  - 1) Fill in information gaps re Corridor property information
    - a) Obtain and analyze data from the most recent windshield survey of housing conditions (performed by Valley Metro staff re application to FTA for LRT funds)
    - b) Identify and map under-utilized properties, those in which the assessed value of improvements is >20% of the total assessed value of the property
  - 2) Establish a database in which data on Corridor properties will be maintained as current and can ideally incorporate information reported to the city by neighbors and stakeholders

- c. Establish and launch operation of a Corridor Land Bank, to facilitate housing and community-based commercial property retention and development
  - 1) Secure advice from national organizations with a mission of counseling land banks
  - 2) Pending advice from national experts, establish the land bank initially as a not-for-profit community development corporation; with enabling local and state legislation, involve the land bank as a publicly approved receiver of tax delinquent properties
  - 3) Assign the maintenance and active use of the Corridor Property Database to the Land Bank
  
- d. Engage national partners or form and advise local organizations to implement strategies for maintaining the affordability of newly developed or improved housing
  - 1) ROC USA or a comparable national organization to coordinate tenants in taking cooperative ownership of their housing
  - 2) A national organization with a mission of fostering land trusts
  
- e. Develop and pursue an ongoing affordable housing retention and initiative in the Corridor, through the coordinated efforts of project partners:
  - 1) The Land Bank maintaining necessary information and taking control of vacant and under-utilized land for development by project partners
  - 2) SCC partners undertaking mixed income and mixed use affordable housing development projects in Corridor station areas
  - 3) Trellis providing favorable financing and counseling for housing owners including: lower income homeowners who might not otherwise qualify for home mortgages
  - 4) National partners or trained local organizations collaborating with other team partners to establish resident ownership or long-term maintenance as affordable housing under the terms of a land trust
  
- e. Address unusual conditions in the Corridor's housing mix that affect affordability
  - 1) High percentage of resident-owned homes that do not have a mortgage
    - a) Investigate reasons for the prevalence of home ownership without mortgages
      - i) Examine public records of home purchases, deed transfers, building permits, and code violations
      - ii) Survey a representative sample of homeowners
    - b) Work with Sustainable Community Collaborative partners and particularly with Trellis to develop programs and outreach that will enable low-income homeowners to obtain financing and improve their homes
  - 2) High percentage of mobile homes
    - a) Develop an understanding of the ownership and condition of mobile homes
      - i) Examine public records regarding mobile home land and housing unit ownership, ownership transactions, and housing code violations
      - ii) Survey a representative sample of mobile home residents
    - b) Work with ROC USA or a comparable organization as well as Trellis to increase the frequency of home ownership and the condition of mobile home housing

- f. Capitalize on geographically specific federal incentives for affordable housing development
  - 1) In the Lincoln station area and any other station area that may qualify for New Market Tax Credit (NMTC) investment, explore opportunities to link affordable mixed-income housing to job creating investments
  - 2) Utilize the expertise of public housing agencies and Sustainable Community Coalition partners to include Low Income Housing Tax Credit (LIHTC) financing to affordable housing development throughout the Corridor
  - 3) Capitalize on the high coverage of newly designated federal Opportunity Zones (O-Zones) in the Corridor by seeking partnerships with O-Zone investment funds to develop mixed-income and mixed-use projects
  
- g. Address the issue of homeless people gravitating toward public transportation
  - 1) Recognize that homelessness is the “tip of the iceberg” of poverty in America, that the large majority of homeless people are in this situation temporarily, that the homeless population churns with marginally employed people becoming homeless as part-time jobs are lost and social relationships breakdown although most homeless people correct these situations quickly, that a “core group” of homeless people are mentally ill and/or addicted to drugs or alcohol. Collaborate with social service agencies to cope with these situations.
  - 2) Recognize that programs to provide affordable housing with paths to stable employment, along with adequately funded mental treatment programs, are the best long-term solution to homelessness.
  - 3) Welcome counseling programs and well-managed group home institutions as an integral part of the community.
  - 4) Establish standing relationships with initiatives such as PHX C.A.R.E.S., as well as with police and mental health and shelter programs to move homeless people who create public nuisances from public station areas to care facilities, including day shelters to ensure individuals have safe, cool places to spend the day when staying at an overnight-only shelter.
  
- h. Implement the public policy measures recommended in Paper IV of this series to accelerate the affordable housing initiatives outlined here.
  
- i. Examine the other cost burdens on residents in the area that may contribute to financial insecurity, including energy and water bills, and work to address them, such as with retrofit and conservation programs.
  
- j. Recognize the critical importance of sustainability measures for TOD in Phoenix and adopt the strategies to incorporate sustainable measures in the affordable housing and general eTOD strategies presented in Section B of this paper.

## B. Sustainability in Community Development

### 1. Climate Conditions and Trends

The Southwest region, already prone to extreme heat and drought, is projected to become significantly hotter and drier as a result of climate change.<sup>18</sup> Extreme heat and drought can have several linked and impacts in urban areas. See Figure 1 for an illustration of cascading effects and options for disruption the chain of adverse impacts, which directly affect the affordability, health, and well-being of Phoenix's villages.

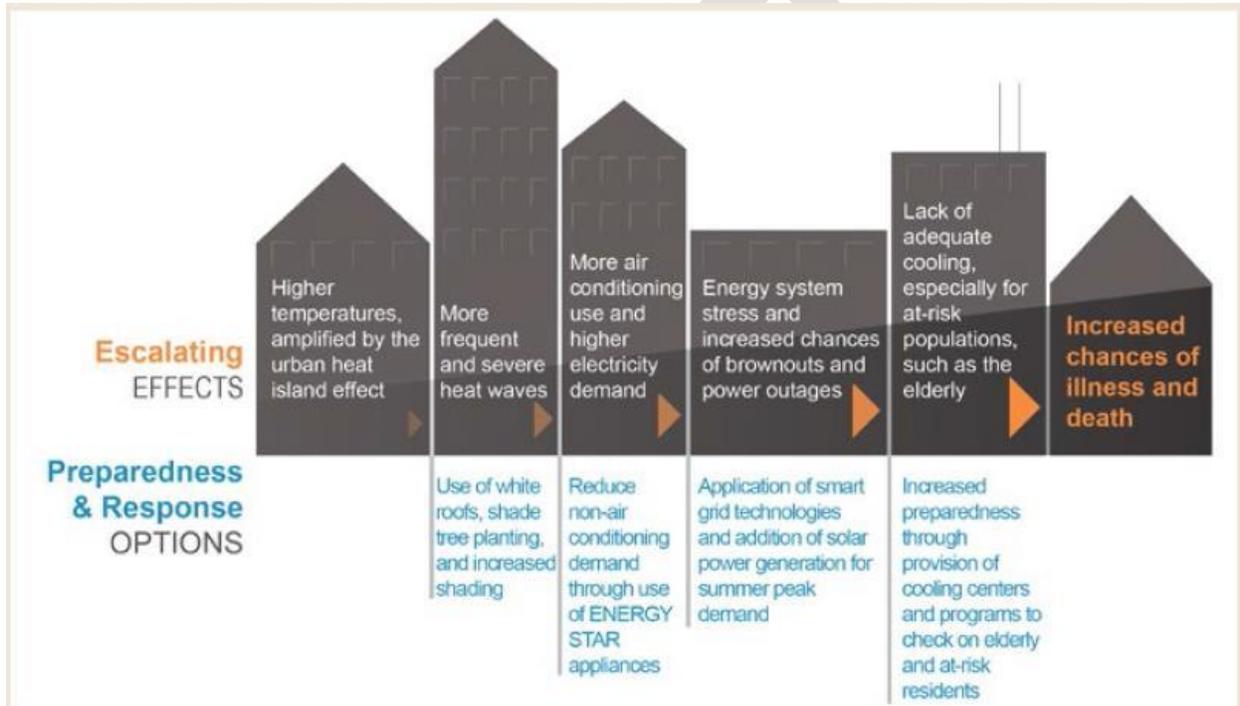


Figure 1. Extreme heat has cascading impacts on energy demand and human health. Several response options can be used to disrupt the chain of impacts and lower risk of heat stress and death. Source: The Third National Climate Assessment (2010).

#### a. Water Demand and Water Bills

Phoenix, which has been in a regional drought since 2000, receives its water primarily from snow pack that flows to the Salt, Verde, and Colorado Rivers, with a small amount coming from groundwater and treated effluent.<sup>19</sup> The Salt-Verde reservoir system, as of July 2018, was approximately half full.<sup>20</sup> Regionally, snowpack and streamflow is projected to decline, and water conservation, while effective, is not projected to be sufficient to preserve surface water supply and reliability.<sup>21</sup> Water scarcity may result in higher water bills for residents and local businesses, as well as the loss of shade trees and vegetation that combat the urban heat island.

<sup>18</sup> Garfin et al. (2014), Ch. 20: Southwest. Climate Change Impacts in the United States: The Third National Climate Assessment

<sup>19</sup> City of Phoenix (n.d.) [Water Supply Q&A](#).

<sup>20</sup> Arizona Drought Monitoring Technical Committee, [Quarterly Drought Status Update: July 2018](#)

<sup>21</sup> Garfin et al. (2014), Ch. 20: Southwest. Climate Change Impacts in the United States: The Third National Climate Assessment

## b. Energy Demand and Energy Bills

Many residents adapt to extreme heat through the use of home air conditioning. However, studies of Phoenix show an inequitable burden on low-income minorities, who experience higher neighborhood temperatures, and have less ability to pay the increased energy bill caused by air conditioning.<sup>22</sup> In some areas of the Southwest, high energy loads have resulted in brownouts and power outages.

## c. Heat Stress and Air Pollution

Finally, the public health impact must be noted. Extreme heat is the leading cause of weather-related deaths in the U.S., and Arizona has the highest national rates.<sup>23</sup> Residents face additional heat stress when nighttime temperatures stay high and low-cost cooling strategies like fans are less effective. Suicide rates rise with heat waves; some medications interfere with body temperature regulation; and dementia is a risk factor for heat-related death.<sup>24</sup> Research suggests that violent crime rises with warmer temperatures, especially unseasonably warm winter days.<sup>25</sup>

In addition, Phoenix, like other large cities, is more likely to experience heat waves and degraded air quality due to “urban heat island effect.” Urban heat island refers to the fact that large cities are 1.8 – 5.4 degrees warmer than the surrounding rural areas – and as much as 22 degrees warmer on still nights.<sup>26</sup> This happens because as cities are built up, vegetation changes from trees and shrubs to pavement and buildings – which means less shade from trees, less evaporation of water from plants (which cools the air), and more heat-absorbing building materials (such as asphalt parking lots and rooftops). Urban heat island degrades the air quality in our communities, by directly creating ground-level ozone.<sup>27</sup> Air pollutants are also released from sources like power plants, factories, cars, and trucks. Nationally, ozone and particle pollutants are estimated to cause between 1,000 – 4,300 deaths by 2050.<sup>28</sup>

## 2. Improve Physical Access to Transit Stations & Commercial Districts

### a. Reduce heat stress and air pollution through buffer parks

On hot days, pedestrians and cyclists travelling to the nearest transit station may be at risk of heat stress or asthma. Buffer parks, also called vegetated buffers, are clusters of trees, shrubs, and other vegetation strategically located along roadways or surrounding industrial property or freight areas.<sup>29</sup> They are an effective solution for providing shade, cooling the air, and filtering out air pollution. The evaporation

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<sup>22</sup> Grossman-Clarke et al. (2010), “Contribution of Land Use Changes to Near-Surface Air Temperatures during Recent Summer Extreme Heat Events in the Phoenix Metropolitan Area.” *J. Am. Meteorological Soc.*

<sup>23</sup> Garfin et al. (2014), Ch. 20: Southwest. *Climate Change Impacts in the United States: The Third National Climate Assessment*

<sup>24</sup> Luber et al. Ch. 9: Human Health. *Climate Change Impacts in the United States: The Third National Climate Assessment*

<sup>25</sup> Shinasi & Hamra (2017) A Time Series Analysis of Associations between Daily Temperature and Crime Events in Philadelphia, Pennsylvania

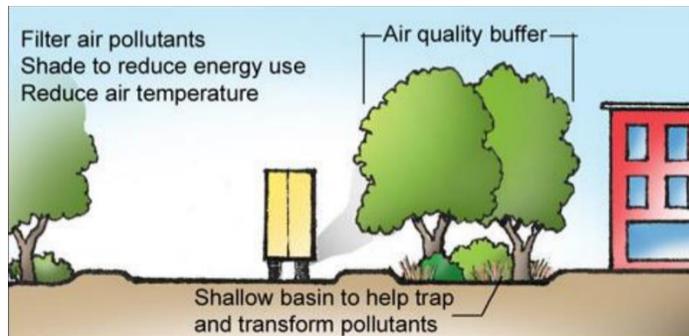
<sup>26</sup> U.S. EPA (n.d.) Learn about Heat Islands.

<sup>27</sup> U.S. EPA (n.d.) Heat Island Impacts.

<sup>28</sup> Luber et al. Ch. 9: Human Health. *Climate Change Impacts in the United States: The Third National Climate Assessment*

<sup>29</sup> USDA. Conservation Buffers. Chapter 6.3 “Air Quality Buffers.”

from a single large tree can produce cooling effects similar to ten room-sized air conditioners operating 24 hours a day. A 65 – 600-foot-wide buffer could reduce particulate matter, such as dust, gas, and soot, by 40 – 75%.<sup>30,31</sup> Buffer parks may be an especially important strategy for areas of the eTOD which contain industrial uses and brownfields.<sup>32</sup>



Vegetated air quality buffer.

Image Credit: USDA

Buffer parks also provide several other benefits, including improved health, reduced utility expenses, and enhanced climate protection and resiliency.

- Research shows that buffers have the potential to improve respiratory health; and lower the number of cases of heart attacks, irregular heartbeat, cardiovascular disease, low birth weight infants, and cancer.<sup>33,34</sup> Trees, and open space in general, have also been shown to improve mental health and reduce violent crime.<sup>35</sup>
- Linear buffer parks act as a noise barrier for residents, reducing sound from a road or industrial zone.
- Buffer parks offer space for walking and running trails, play spaces, and neighborhood gathering spots. If trails and other recreational uses are included in a buffer park, they should be surrounded by vegetation to protect residents from pollution.<sup>36</sup>
- Trees and other plants are effective at reducing greenhouse gases. One acre of tree cover absorbs 2.2 tons of carbon per year.<sup>37</sup>
- The cooling power of trees translates into household savings, as families need to turn on the A/C less often.
- Buffer parks can incorporate a variety of community benefits to increase equity and community ownership, such as: workforce development for the landscaping sector; specifying local hire

<sup>30</sup> USDA Forest Service (2008) *Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways*.

<sup>31</sup> CMAP (2013) *Go To 2040 Strategy Papers: Parks and Open Lands: Environmental Benefits*

<sup>32</sup> Arizona State University Metis Center (May 2018) *Sustainable Infrastructure and South Mountain Village: Land Use and Transit Oriented Development*

<sup>33</sup> EPA (2015) *Nearby Roadway Air Pollution Health*

<sup>34</sup> California Environmental Protection Agency Air Resources Board. (2005) *Air Quality and Land Use Handbook: A Community Health Perspective*.

<sup>35</sup> Kardan, et al. (2015) Nature: Scientific Reports. *Neighborhood greenspace and health in large urban center*. DOI: 10.1038/srep11610

<sup>36</sup> USDA Forest Service (2008).

<sup>37</sup> CMAP (2013)

requirements for the park installation and maintenance contracts; procuring plants and amendments from local businesses; and providing grants, technical assistance, or donated materials to local manufacturers or freight operators who install buffer parks.

#### b. Create Complete Streets to link residents and businesses to transit stations

Sustainable physical access can be achieved by using Complete Street design principles within the eTOD. Shaded and pleasant pedestrian paths, designed in alignment with Phoenix’s Walkable Urban Code (WU Code, Zoning Ordinance Chapter 13), Complete Street Policy and forthcoming Design Guidelines,<sup>38</sup> will enable residents to safely and conveniently access the new transit stations. Green infrastructure such as trees, which provide shade and lessen urban heat island effect, are particularly important for residents who will walk or bike to the transit station.

The WU Code provides guidance regarding shade requirements (e.g., percent shade, tree species, architectural features), and water management, and public art.<sup>39</sup> Public art, which creates a more enjoyable pedestrian experience, is also a powerful signifier of the identity of the neighborhood. In many eTODs, neighborhood artists are engaged to create art that elevates the cultural presence and visibility of current residents.

Complete Street principles offer several additional benefits to public health, equity, the local economy, and sustainability.

- Complete streets reduce traffic crashes by permanently reducing vehicle speed and discouraging sidewalk riding by cyclists. Reducing travel speeds, through designs such as “road diets” that narrow lanes, is particularly important. When a pedestrian is struck by a car at 20 mph, they have a 25% chance of severe injury, and a 5% chance of death. At 30 mph, the risk is 50% for severe injury and 25% for death; above 50 mph, severe injury or death is almost certain.<sup>40</sup>
- Complete streets combat obesity by encouraging walking and biking. One study found that every additional hour of driving per day increases the risk of obesity by 6%, while each kilometer (0.6 miles) walked reduces risk by 5%. Similarly, a study of 32 neighborhoods found that living in more walkable areas increased physical activity and decreased obesity for residents, regardless of income level.<sup>41</sup>
- Wide crosswalks, uneven sidewalks, and improperly pitched or missing curb cuts make roads inaccessible to non-drivers. Complete street road designs better meet the needs of individuals with limited mobility, including the elderly. Complete streets combat other inequities too - traffic crashes are more fatal for older individuals.<sup>42</sup>
- Complete streets help household finances and boost local businesses. Complete streets lower household costs by offering an affordable alternative to driving. Local businesses benefit too, from improved foot traffic of potential shoppers, and more options for employees to commute

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<sup>38</sup> City of Phoenix, [Complete Streets Program](#) and [Complete Streets Policy](#)

<sup>39</sup> City of Phoenix, [Zoning Ordinance, Chapter 13: Walkable Urban Code](#).

<sup>40</sup> CMAP (March 2015). Complete Streets: The Basics

<sup>41</sup> Sallis, J et al. (2009). *Neighborhood built environment and income: Examining multiple health outcomes*. Social Science and Medicine 68:1285-1293

<sup>42</sup> Tefft, B.C. (2013) *Impact speed and a pedestrian’s risk of severe injury or death*. Accident Analysis & Prevention, 50:871-878

to work. A study of seven complete street improvements in one city showed sales growth for street-level retail and restaurants over a three-year period after the improvement, when compared to similar unimproved sites and the neighborhood at large.<sup>43</sup>

- Phoenixians are exposed daily to air pollution from vehicles. Fortunately, transit-served neighborhoods have an advantage in reducing pollution from vehicles, because residents are more likely to be able to travel to jobs, shops, and schools, without creating driving emissions. Complete streets encourage people to shift away from driving, and instead use zero-emission transportation like biking and walking. Reducing the number of car trips also reduces the amount of greenhouse gases and other pollution from vehicle emissions (e.g., particulate matter, NOx, and volatile organic compounds), which will mitigate future climate impacts.<sup>44</sup>

Common Complete Street strategies include curb extensions, refuge islands, and bike lanes. Curb extensions (or “bump-outs”) shorten the crossing distance for pedestrians and improve visibility for drivers. They reduce speed and improve stop sign compliance by visually narrowing traffic lanes. “Detached bump-outs” create a vegetated pedestrian refuge between the sidewalk and the travel lane. Refuge islands are placed in the middle of a crosswalk, so that pedestrians and cyclists only must cross one direction of traffic at a time. Neighborhood Greenways (or bike boulevards) are comprehensive treatments designed for cyclists, through measures such as traffic calming, traffic reduction, road signs and pavement markings, and crosswalk improvements. Pedestrians and residents also benefit through the elimination of cut-through motor traffic. Bike lanes protected by parking buffers or vegetated strips are becoming more standard as cities seek to make biking safe for travelers of all ages.

### 3. Incentivize Resilient Building Techniques

New construction and major renovation of housing in the eTOD should incorporate resilient building techniques. These techniques will lessen the risk of heat stress and associated health concerns, while lowering household water and energy demand and utility bills. The City of Phoenix may consider mandating and expanding its existing Green Construction Code<sup>45</sup> for developments within the eTOD, to complement the Walkable Urban Code.<sup>46</sup> The City may also consider renewing green building incentives for projects within the eTOD, to attract and enable new affordable housing and other desired development.

#### a. Right-Size Parking

Research by the Center for Neighborhood Technology in four cities demonstrated that parking for multi-family residential development in America is frequently overbuilt by a third or more, particularly in TOD areas. Considering land acquisition, design, paving, and maintenance, the costs of providing parking are thousands of dollars per car space, even if the spaces are built at ground level, without structures; and the allocation of land for parking precludes other uses of this space, such as more housing units.

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<sup>43</sup> New York City Department of Transportation (December 2013) *The Economic Benefits of Sustainable Streets*

<sup>44</sup> Zhu, Y. et al. (2016) *Effects of Complete Streets on Travel Behavior and Exposure to Vehicular Emissions*. University of California Los Angeles.; Frank, L et al. (2006). *Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality*. Journal of the American Planning Association.

<sup>45</sup> See 2011 Phoenix Green Construction Code, <https://codes.iccsafe.org/content/document/622>

<sup>46</sup> See the [Chicago Sustainable Development Policy Handbook](#) for an example of performance requirements that are mandated for projects that receive municipal assistance.

Frequently, municipal building codes require the provision of more parking than is required, needlessly driving up housing costs and undermining affordability. However, in cities across the country advocates have rolled back parking requirements in TOD areas through the presentation of research and sample project analyses.

In Phoenix, the Walkable Urban Code provides for flat reduced parking requirement for affordable housing and provides for a percentage of reduced parking spaces for multifamily and single-family attached housing when proximate to a light rail station.<sup>47</sup> A data-driven parking study is recommended to determine whether projected parking needs for affordable housing are less than the current code requirement. Affordable housing developers could increase their capacity to construct housing by applying the results of the right-size parking study to their projects and securing passage of an ordinance that would permit developers to build with right-size parking, as a matter of right in TOD locations.

## b. Energy and Water Efficiency

The effectiveness of energy and water efficiency retrofits in buildings as a means of reducing long-term operating costs in all US climates is widely recognized. Energy and water efficiency programs are attractive to the eTOD for several reasons.

- A variety of financial incentives are available to support energy efficiency and clean energy projects, which can increase the capacity of affordable housing developers to create high-quality housing.<sup>48 49</sup>
- Phoenixians are facing a proposed water rate increase in 2019 and 2020.<sup>50</sup> Water conservation measures, such as a water efficiency building retrofits targeted to low- and moderate-income residents and local businesses, new construction standards for affordable housing that maximize water efficiency, and education and outreach programs, can help keep water bills affordable for eTOD households.
- Energy and water efficiency retrofits may be performed on buildings without transferring ownership to a non-profit entity. Because ownership change is not required, an energy and water efficiency program could benefit privately-owned, naturally-occurring affordable housing stock that currently exists in the eTOD.
- Energy and water efficiency retrofits may be, and often necessarily are, integrated with measures that will reverse overall deterioration in buildings. For this reason, also, energy and water efficiency may provide a wedge for remediating housing deterioration in the community.
- Cost savings can be achieved when an energy or water efficiency contractor is performing a high volume of work within a small geographic area, such as the eTOD, enabling developers to produce housing units at a higher volume.

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<sup>47</sup> City of Phoenix [Walkable Urban Code](#) Table 1307.1 Minimum Required Vehicular Parking

<sup>48</sup> The N.C. Clean Energy Technology Center's [DSIRE](#) database lists a variety of federal and state tax credits, grants, and other financial resources for energy efficiency and renewable energy projects.

<sup>49</sup> Southwest Energy Efficiency Project (SWEET) summarizes currently available utility-run energy efficiency programs that provide incentives to help residential and business customers to install energy efficient products and perform energy efficiency building retrofits. <http://www.swenergy.org/programs/utilities/state/arizona>

<sup>50</sup> City of Phoenix, Water and Sewer Rates and Charges, <https://www.phoenix.gov/waterservices/customerservices/rateinfo>

- An energy and water efficiency program can provide a pipeline for workforce development and job opportunities in the construction sector.

The State of Arizona sets annual conservation goals for energy and water utilities.<sup>51 52</sup> These goals are met, in part, through programs for residential and business customers such as APS' Multifamily Energy Efficiency Program and Southwest Gas' Weatherization Program.<sup>53 54</sup>

The City of Phoenix has supported energy efficient construction by incorporating the 2018 International Energy Conservation Code into its building code. The City of Phoenix previously implemented Energize Phoenix, a three-year energy efficiency program funded by a \$25 Million federal ARRA grant and initiated in 2010, which provided energy efficiency retrofits in residential and commercial buildings along the Metro Light Rail line.<sup>55</sup> While there are no water efficiency rebates currently available to Phoenicians, the City provides plumbing retrofits to income-qualified homeowners referred by the Human Services and Neighborhood Services Departments.<sup>56 57</sup>

Affordable housing developers would benefit from a new targeted program to implement high-performance energy and water efficiency technology in building retrofits and new construction throughout the eTOD. A targeted energy and water efficiency program for affordable housing should provide a coordinated and integrated "one-stop shop" across utility efficiency programs that offer rebates and other incentives. One-stop shop programs provide housing developers and owners with a single point of contact to facilitate and streamline the retrofit process. One-stop shops perform outreach and education to building owners and developers, enroll eligible participants into utility programs, provide technical assistance to identify needed efficiency improvements, conduct construction oversight of the project, and identify available financial incentives across multiple utility programs and other grants.<sup>58</sup>

#### Building Envelope Efficiency Measures & Heat Stress

During extended power outages, buildings may become quickly uninhabitable as interior temperatures rise. A high-performance building envelope slows the change in temperature, allowing residents to stay indoors more safely. Common envelope efficiency strategies include (see Figure 5):

- Conducting an energy audit to identify areas with insufficient insulation and air leakage;
- Sealing air gaps around ventilation and other openings in the building envelope;
- Adding roof and wall insulation;

<sup>51</sup> ACEEE, [State and Local Policy Database: Arizona](#)

<sup>52</sup> City of Phoenix, "Water Resources and Conservation FAQs," <https://www.phoenix.gov/waterservices/resourcesconservation/FAQs>

<sup>53</sup> APS, "Multifamily", <https://www.aps.com/en/business/savemoney/by-business-type/Pages/multifamily.aspx>

<sup>54</sup> Southwest Gas, "Weatherization Program," <https://www.swgas.com/en/arizona-weatherization>

<sup>55</sup> City of Phoenix, "Energize Phoenix," <https://www.phoenix.gov/oep/environment/energizephoenix>

<sup>56</sup> City of Phoenix, "Water Resources and Conservation FAQs," <https://www.phoenix.gov/waterservices/resourcesconservation/FAQs>

<sup>57</sup> City of Phoenix, "Plumbing Retrofit Program," <https://www.phoenix.gov/waterservices/retrofit>

<sup>58</sup> See the Energy Efficiency for All factsheet "[One-Stop Shops for the Multifamily Sector](#)" for more information.

- Upgrading windows and natural ventilation;
- Reducing urban heat island effect by planting shade trees and other vegetation;
- Using “cool roofs” and light-colored parking lots to reflect heat;
- Using window treatments such as awnings, overhangs, and shades; and
- Orientating new buildings and vegetation to reduce solar gain.

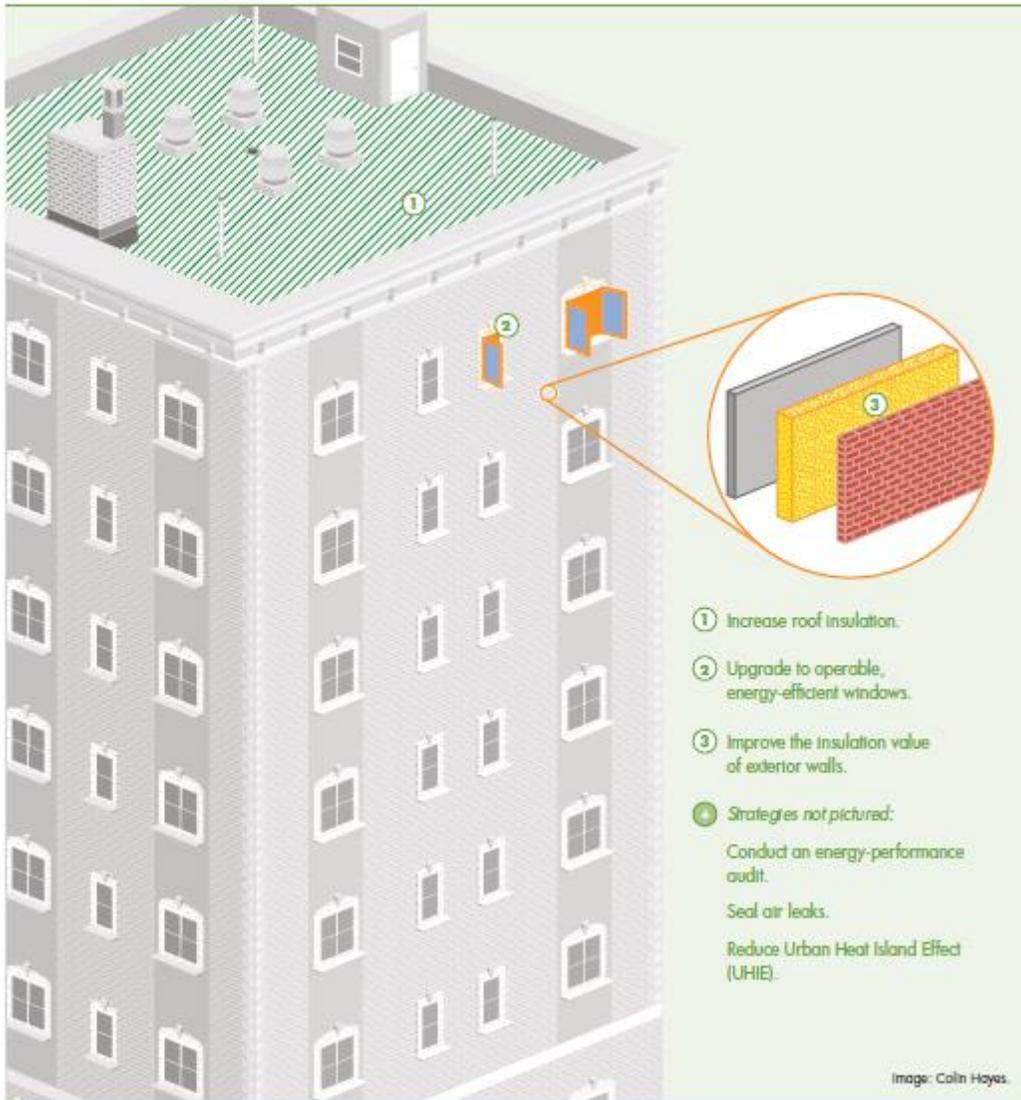


Figure 2. From Enterprise Community Partners, "Strategies for Multifamily Building Resilience"

### c. Renewable Energy

Clean energy is a key component of climate protection and improved public health. A neighborhood-scale energy approach within the eTOD can create economies of scale for developing clean energy projects, provide environmental benefits, increase resilience, and offer economic opportunities for residents.

## Community Solar

In addition to the environmental benefits of clean energy, community solar can provide economic benefits to eTOD residents, thus helping to maintain the affordability of the neighborhood. For example, homeowners and businesses that host a community solar installation receive a lease payment. Businesses can hedge their bets against uncertain fossil fuel prices. Residents also benefit from lower electricity bills. Community solar programs can incorporate a variety of community benefits to increase equity, such as:

- Local hire and local contracting requirements for community solar construction and subscription management services
- Directing a percentage of community solar revenue towards a local community assistance fund or community-based organizations
- Targeting or restricting subscriptions to a specific geography and/or income-eligible households; Selecting a host site that redevelops underutilized land, such as brownfields
- Donating energy to residents (e.g., the host site, such as a church or multifamily building, purchases the electricity, uses some of it and gifts the remainder to congregants or tenants)

The community solar model allows all residents and organizations to benefit from clean energy, even if individual buildings face barriers to rooftop solar such as incompatible roof or adjacent land uses; not having full ownership of the roof (e.g., renters, condos); or the expense of paying the upfront cost of solar panel installation. Solar energy customers do not have to be physically connected to the solar facility, but they must be located within the service territory of the electric utility, in order to “subscribe” to the program, as illustrated in the figure on the following page.

The “host site,” or physical location, for a solar array can be a large rooftop, a parking lot, or vacant land. Several factors must be considered when evaluating a host site, including zoning; public acceptance and subscriber interest; physical obstructions; land value and ownership; and the size, orientation, and condition of the roof or ground surface. Brownfields, and land owned by a municipality or a land bank, may be more feasible for community solar development, due to lower land acquisition costs.<sup>59</sup>

Large solar arrays may be less attractive in areas meant to be walkable, dense urban neighborhoods, and have the potential to create negative impacts such as glare. In a neighborhood such as the eTOD, smaller arrays can be added to roofs or as parking lot canopies. Low-impact solar design, such as placing arrays within a larger landscaped commercial or institutional campus, can improve community acceptance of an installation.

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<sup>59</sup> *Communication with Elevate Energy (V. Greco, 6/19/18).*

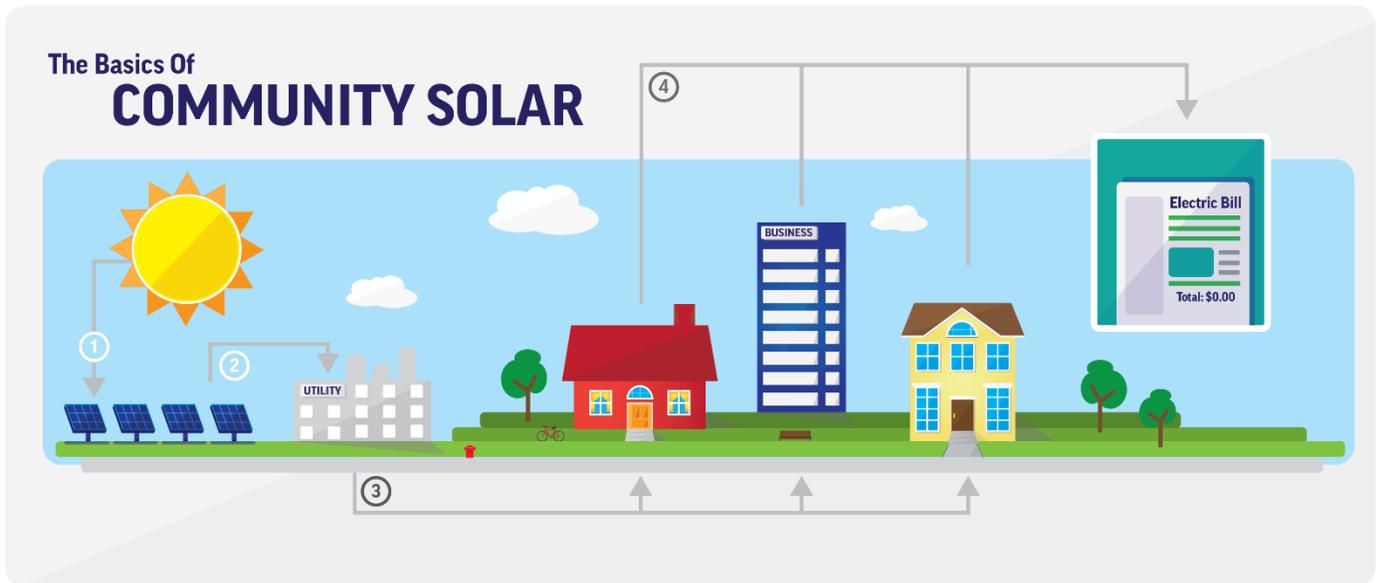


Figure 3.

1. Sunlight hits the solar panels at the community solar facility. The solar panels convert the sunlight to electricity.
2. Electricity flows to the electrical grid. The amount of electricity generated by the solar panels is measured by an on-site meter.
3. The utility company calculates the dollar value of the electricity and divides this amount among the community solar subscribers.
4. The dollar value of the electricity is applied as a credit on each subscriber's energy bill.

Image Credit: <https://solect.com/solar-power-to-the-people-understanding-community-solar/>

There are several types of community solar programs. The solar installation may be a large photovoltaic (PV) solar facility that generates energy for multiple energy customers, or a series of smaller installations distributed across various sites. Some installations are owned by the utility; others are owned by a solar developer. The community solar system could also be owned by a non-profit, public agency, or a special purpose entity. For example, energy utility APS has recently launched a community solar program that installs free rooftop solar panels for eligible low- and moderate-income customers. APS owns the solar system and the energy it produces; in exchange the participating homeowner receives a fixed monthly credit on their electric bill.<sup>60</sup> Salt River Project, which serves most of the eTOD area, also offers a residential solar program.<sup>61</sup>

#### d. Critical Backup Systems

During a power outage, maintaining critical building systems can be life-saving for residents. Building owners may choose to invest in a generator for backup power or install a permanent exterior connection so that a temporary generator can be quickly used during an emergency. To provide emergency lighting for extended periods, battery- or solar-powered lighting systems can be installed.

<sup>60</sup> APS Solar Communities Program, <https://www.aps.com/en/ourcompany/aboutus/investmentinrenewableenergy/Pages/aps-solar-communities.aspx?src=hero>

<sup>61</sup> SRP, Residential Solar Electricity, <https://www.srpnet.com/menu/electricres/solar.aspx>

Natural daylighting, via windows or skylights, allow stairwells to be used safely without emergency lighting.

In the event of disruption to municipal water supply, greywater reuse and rainwater harvesting systems can provide access to non-potable water.<sup>62</sup> The State of Arizona is a leader in greywater reuse legislation and has provided tax credits for rainwater harvesting systems.<sup>63</sup>

These types of resilience measures should be encouraged or required for affordable housing developments that serve vulnerable populations, such as elderly or disabled residents.

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<sup>62</sup> See for an overview of Arizona state regulations: National Conference of State Legislatures (2018) “State Rain Water Harvesting Laws and Legislation,” <http://www.ncsl.org/research/environment-and-natural-resources/rainwater-harvesting.aspx#State>

<sup>63</sup> The National Academies of Sciences, (2016) *Using Graywater and Stormwater to Enhance Local Water Supplies: An Assessment of Risks, Costs, and Benefits*