

# San Antonio Human Progress and Human Services 2035 Scenarios

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*By SA2020 and the Institute for Alternative Futures,  
Supported by the Kresge Foundation*

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## Introduction

What will human progress, human need and human services be in San Antonio, Texas in 2035? What implications does it have for today's strategies for public and private human service providers and community partners? These San Antonio Human Progress and Human Services 2035 Scenarios offer a tool for the San Antonio and Bexar County human services community to explore these questions at the level of their own jurisdiction and to better inform future-oriented, long-term strategies and efforts. For this purpose, these scenarios consider a range of forces, challenges, and opportunities shaping local and national human services, and offer a plausible set of expectable, challenging, and visionary pathways for how human services may change over the years to 2035, and the roles of current human service providers within these plausible pathways.

These Scenarios will be used at the December 7, 2017 Scenario Workshop hosted by SA2020 where participants will consider their current directions and strategies, including their “robustness” or potential for success in multiple scenarios. Participants will also develop recommendations.

These San Antonio Human Progress and Human Services 2035 scenarios are an important part of a larger project – Human Progress and Human Services 2035 – conducted by the Institute for Alternative Futures (IAF) and supported by the Kresge Foundation. In addition to developing scenarios for the human services community in six cities and counties and two states, IAF is developing a set of national human service scenarios. These national scenarios will allow human service leaders, practitioners and partners to consider challenging their own assumptions about the future, identify emerging risks and opportunities, and formulate more robust strategies with a greater potential to advance their mission over the decades to come.

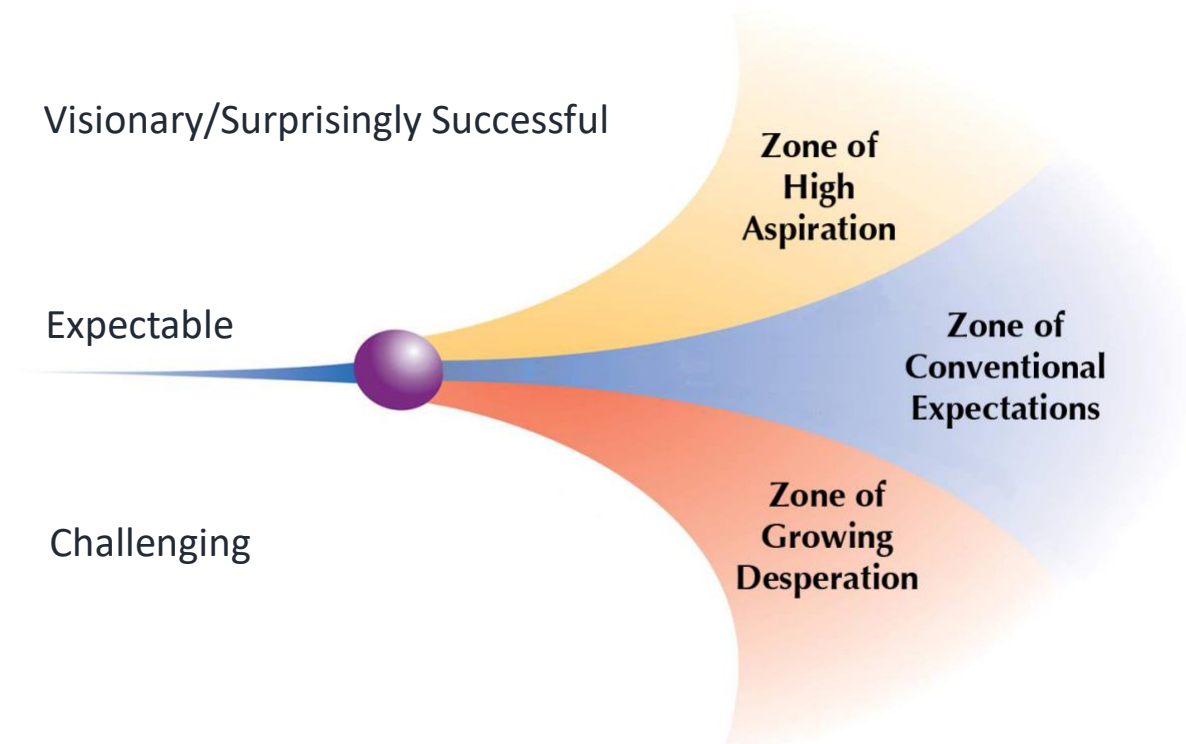
## Why scenarios?

The future is uncertain. However, scenarios – different stories describing how the future may unfold – can be used to bound that uncertainty into a limited number of paths. These paths help us think about different probabilities in a larger space of possibilities. Scenarios also force us to consider the systems surrounding our topic and to clarify our assumptions. People who work with scenarios find more creative options than those who plan based only on the past and present. Strategies, plans, and actions can also be “future tested” against the different scenarios to assure robust initiatives that have more potential for success. Scenarios provide a powerful method for systematically addressing the uncertain future.

## Methodology

IAF partnered with the SA2020 and community partners to develop the scenarios using the “Aspirational Futures” approach which IAF has evolved over the last three decades. This technique creates forecasts and then scenarios in three zones (see **Figure 1** below):

- A “zone of conventional expectation” reflecting the extrapolation of known trends, the expectable future (scenario 1);
- A “zone of growing desperation” which presents a set of plausible challenges that an organization or field may face, a challenging future (scenario 2); and
- A “zone of high aspiration” in which a critical mass of stakeholders pursues visionary strategies and achieves surprising success (scenarios 3 and 4).



**Figure 1:** IAF’s “Aspirational Futures” Technique

The San Antonio Human Progress and Human Services 2035 scenarios presented on the following pages were developed based on a review of human services programs and activities, plans and documents. We held interviews and focus groups with 16 Community partners with expertise on various human service aspects. We explored “driving forces” and preliminary forecasts for the economy, employment, the environment, technology, as well as trends within specific areas of human services (aging, behavioral health, children youth and family, disability, food and nutrition, housing, and income supports). San Antonio is fortunate to have two sets of shared goals in the SA 2020 goals and the SA Tomorrow Sustainability Plan that looks out to 2040. We used these to frame San Antonio’s aspirations or visionary forecasts.

More than 20 human service and community leaders assembled on January 20, 2017 to review the preliminary forecasts and develop the distinct scenarios presented below.

- 1- (Expectable) The Least We Will Do
- 2- (Challenging) Even Scarier
- 3- (Visionary) Fiesta
- 4- (Visionary) SA2020 Realized

Each scenario description will begin with an overview of the economy, technology and human services, followed by the forecasts for specific human service areas: aging services, behavioral

health services, child and family services, disability services, housing services, food and nutrition, and income support services.

## San Antonio Goals: SA 2035 Community Report Card

Achievement of the SA2020 Goals and those in the SA Tomorrow Sustainability Plan will vary depending on the forces in the macro environment (particularly the economy, employment, technology, federal policy and climate change), in Texas and in the City and County, as well as the intensity with which the City and County pursue their preferred futures. These San Antonio Human Progress and Human Services 2035 Scenarios play out the forces at those levels and the community’s actions.

The chart below identifies the extent to which key human service related SA2020 and 2040 goals were achieved (or not) in the scenarios – expressed as the SA2035 Community Report Card. The scenarios tell the story of how the forces interacted, and how some of the goals altered their focus or were transformed.

### SA 2035 Community Report Card

Achievement of the combined SA2020 Goals and SA Tomorrow 2040 Goals in different scenarios.

**Key:** Improved: +, ++, +++  
 Flat or Stagnant: =  
 Worsened: -, --, ---

Community Indicator	Scenario 1 (Expectable)	Scenario 2 (Challenging)	Scenario 3 (Visionary)	Scenario 4 (Visionary)
Increase Volunteerism	+	+	+++	+++
Increase Philanthropic Giving	+	+	++	+++
Reduce Recidivism	=	--	+++	+++
Reduce Index Crime Rate	+	--	+++	+++
Decrease Domestic Violence	+	--	+++	++
Increase Per Capita Income	-	---	++	++
Abundance advances lower cost of living	+	+ (Home grown food)	++	++
Reduce Unemployment	-	---	-	-
Reduce Underemployment	-	---	+	++
Improve Kindergarten Readiness	+	--	++	++
Improve 3 <sup>rd</sup> Grade Reading	+	--	++	++
Increase High School Graduation Rates	+	---	+++	+++

Reduce Carbon Energy Use	+	+	+++	+++
Increase Solar Energy Use	++	+	+++	+++
Increase Development with Low Environmental Impact	+	-/=	+++	+++
Reduce Poverty Rate	+/=	---	+++	+++
Reduce Homelessness	-/=	---	++	++
Decrease Child Abuse	+	--	+++	+++
Improve Maternal and Child Health	+	-	+++	+++
Reduce Diabetes Rates	+	-	+++	+++
Improve Access to Health Care	=	--	+++	+++
Universal Access to Affordable Health Care	-	--	+++	+++
Expand affordable housing, healthy by design	+	=	+++	+++
Reduce Health and Behavioral Risks	+/=	--	+++	+++
Improve Housing Affordability and Transportation Affordability	+	--	+++	+++
	+	=	+++	+++
Mixed use development;	+	+	++	++
Mixed income neighborhoods	+	+	++	++
Resilient Neighborhood Preparedness	+	+	++	++
Communities, parks, and other resources to maintain active healthy lifestyles	++	=	++	++
Reduce urban heat island effects, especially in underserved areas	+	-	++	++
Increase affordable healthy food	++	++	+++	+++
Increase local food production	++	++	+++	+++

## Scenario 1: (Expectable) The Least We Will Do

*The U.S. economy had slow economic growth, at 1 to 2% each year between 2015 and 2035, with downturns for recessions and higher growth in the years just after the recessions. Texas and San Antonio had similar, sometimes higher, economic growth. Meanwhile, employment continued to transform. Many jobs were automated, a net loss of 7% nationally by 2025 and significantly more by 2030<sup>i</sup>. Lower skilled workers were most impacted by this job loss, though middle and high-income jobs were also lost in large numbers. For the lowest paid of those employed in “jobs” the minimum wage rose slowly, but most positions moved to piece work on the “gig” economy. As the state experienced its “age wave” many Baby Boomers retired.*

*San Antonio’s minimum wage increased overtime toward a living wage. Poverty and income segregation lessened but persist due to their longstanding roots in San Antonio and as more jobs were lost to automation. However, military, certain industries such as Amazon and Toyota, and sectors such as health care and cyber technology were areas of economic growth. The poverty rate overall lessened in the 2020s and onward.*

*Human services overall in San Antonio and Bexar County were influenced by an increased elderly population, changes in family structure such as fewer births to single teen mothers, economic transformations, and climate related issues such as migration and extreme weather events. The San Antonio sustainability plan built some resilience to climate change, but severe weather-related problems persisted. A new challenge emerged as San Antonio and Austin populations grew and merged. This created a metroplex, with more people traveling back and forth, increased migration, with needs and populations overlapping. The multiple and separate municipalities in the County complicated issues. Human service deliverers used two generation strategies to focus on the workforce, child care, behavioral health, transportation, economic development, and educational preparation for work. Some human service funding moved towards a “pay for success” model accelerated by public-private partnerships.*

*The City worked to embed equity into departments and services. These efforts included:*

- *City expenditures were based on need rather than being equally distributed across the city’s 10 districts*
- *Increasing health, equity and neighborhood connectivity through infrastructure and street projects*
- *SA2020 led the way towards increased community accountability, creating and using a set of community indicators to show progress*
- *The creation of the City Health and Equity Committee*

*These efforts provided the City advancement and resilience, particularly as challenges evolved over the years.*

*San Antonio remained dedicated to embracing its diverse population; however, restrictions and monitoring by federal agencies increased significantly, disproportionately impacting services available for immigrants, refugees, and asylum-seekers. Integrated information systems allowed sharing of information across health and human service agencies – making targeting, delivery and evaluation of human services easier. Intelligent agents used in human services grew more sophisticated and effective. Instant translation of languages used by human services customers*

*was fast and accurate. By 2025 cognitive computing tools were handling much of the case management work, lowering human case manager's work load and allowing them to focus on the cases most in need and to oversee the work of the intelligent agents<sup>ii</sup>. Humans remained to oversee the work of robots and provide human touch where necessary.*

## Aging Services 1

Aging services evolved as by 2035, the number of people aged 65 and older in Bexar County had nearly doubled from 2015 levels to reach over 410,000<sup>1</sup>, influenced by Baby Boomers and people that chose to retire in San Antonio. Some elders settled in the city, and others on the outskirts. This, at times, complicated access to services. Despite some persisting problems with isolation, social health for elders became a focus throughout the 2020s and is a key part of the wellbeing index used for senior services.

Senior services were integrated across the community through libraries, schools, cafes, and churches. YMCAs, the Jewish Community Center and others engaged as multiple use and multi-generational centers. Informal group homes and senior villages became more common in the 2020s. These centers, homes and neighborhoods emphasized the importance of aging with others; the Latin culture of San Antonio more easily embraced multigenerational homes. It became more common for housing and communal living arrangements to include people of different age groups which was both economical and more sustainable. Other influences on senior centers and shared homes included:

- Universal design such as walkability and safe sidewalks built into most homes and neighborhoods
  - The SA2020 and Sustainability 2040 plan helped improve walkability
- A shift in the stigma and language surrounding 'group homes' and villages which aided more clustering of services in neighborhoods and communities
- Uber-like ride sharing, sometimes subsidized by the City and United Way, increased the mobility of low-income seniors
- Telemedicine and virtual medicine enables at-home care
- Some villages and centers provided access to services such as yard maintenance, home repair, transportation, and health and wellness initiatives
- 3D printing, community gardening and other production was shared; aiding older adults to save money and share resources.

As the number of seniors in the area increased, there were increased instances of disease and related disabilities. The percentage of individuals in San Antonio aged 65 and older with diabetes

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<sup>1</sup> Texas Office of the State Demographer, cited by San Antonio Area Foundation, *Projected Number of Seniors Age 65+ in Bexar County*, <http://www.saafdn.org/Portals/0/Uploads/Images/initiatives/Population%20Projection%20Chart%20with%20source.jpg>, Accessed 25 January 2017.

reached more than 25% by 2030 (102,500)<sup>2</sup>. The Alzheimer's population in the San Antonio area reached more than 41,000 people by 2035<sup>3</sup>. There were research advances that slowed Alzheimer's, some from the University of Texas; yet this population still required special care and services.

In previous decades, social services for adults focused on helping seniors apply for public and private programs, but this need was reduced as programs became easier to apply for. Technology allowed seniors to operate in more tech-savvy ways during the 2020s, and communities shared this knowledge. Human services, such as those aiding disabled adults to become more self-sufficient and preventing abuse and neglect, became more inclusive and culturally sensitive.

## Behavioral Health Services 1

The need for behavioral health services increased due to the stress and trauma of economic downturn and natural disasters, but the availability diminished repeatedly as health care changed and Federal spending was decreased. Substance abuse, including opioids, increased with growing harm to individuals, families and communities. The actions of human service deliverers were only as impactful as the financial resources available, which were particularly limited in the late 2010s but then rebounded.

During the late 2010s and early 2020s, the high costs to Bexar County of high utilizers (particularly, people who seek treatment through ERs) drew increased attention and led the County to focus more on preventive efforts to lower costs.

Preventive behavioral health efforts for children evolved:

- Behavioral health screening for children began much earlier, generally by their first pediatric appointment. Screening was also done in school
- All schools in the area created a system to identify suicidal and homicidal risk, and developed response programs to combat severe crises
- Most schools in the County developed in-school behavioral health care facilities, which were neighborhood hubs accessible to children and parents
  - However, some inequality persisted across school systems including in-school access to behavioral health services
- School therapists performed individual and family counseling- sometimes even going to the homes of high risk children.

These interventions had some success. Suicide, previously the second leading cause of death among juveniles, decreased.

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<sup>2</sup> Institute for Alternative Futures, *Texas Diabetes Data and Forecasts*, <http://www.altfutures.org/pubs/diabetes2030/TEXASDataSheet.pdf>, Applying San Antonio as 5.6% of Texas population, Accessed 25 January 2017.

<sup>3</sup> Alzheimer's Association, *2017 Alzheimer's Disease Facts and Figures*, <http://www.alz.org/facts/> 1 in 10 over 65 have Alzheimer's. Rates higher for African Americans (2x as likely), Hispanics (1.5x as likely), and women account for 2/3 of all case.



The SA2020 goal of reducing health and behavioral risks was not fully realized but progress was made in reducing the years of life lost prematurely before age 75. And the SA2020 goal of reducing obesity was partially achieved.

Behavioral health care in jails and prisons and post-incarceration expanded and contributed to reduced recidivism in the 2020s.

Case managers were assigned to partner with clients. Partnerships across sectors developed ways to securely obtain and share data with consent, allowing for more effective intervention; however, the success and ability of these interventions fluctuated as behavioral care in the 2020s lacked sufficient human and financial resources.

Churches and other faith-based organizations saw an increase in membership, including virtual congregations. This helped to provide a certain level of behavioral health support; however, some people needed more than churches could provide. Churches created a network across the County to share resources and enhance their outreach and efforts and partner with behavioral health non-profits. This partially filled the gaps left by federal cuts.

Organizations such as Clarity Child Guidance Center led the way in San Antonio's use of predictive analytics, early intervention, and partnerships that addressed behavioral health needs as early and effectively as possible. Most relevant data bases and predictive analytics were primarily operated by the public sector or their providers initially due to privacy concerns.

By the mid-to-late 2020s, the spread of behavioral services was aided by increased use of software programs, smart apps, and virtual reality that could connect with patients and provide effective counseling. Apps evolved, expanding from monitoring physical conditions to monitoring feelings. "Affective computing" used in behavioral health tools proved effective and led to increased acceptance by the patient. Behavioral health apps progressed to virtual reality (VR). This included tele-therapy that uses VR as a tool, virtual therapists created using artificial intelligence, and in-clinic VR therapy. Human therapists provided oversight of these virtual counselors and dealt with the most complex cases. San Antonio continued to work to meet the needs of non-English speaking clients, both through using translation technologies and with bi and multi lingual staff.

## Child and Family Services 1

Child and family services used mobile devices, some task automation, cognitive computing, and streamlining of data across agencies to improve service. Yet fundamentally, while delivery was more effective and efficient, agencies continued to struggle to meet the need.

Immigrants continued to be overrepresented among those living in poverty in San Antonio. During the late 2010s, ICE and other Federal agencies deported hundreds of immigrants living in the City and County. Many deported adults left behind children born in the U.S. who then needed foster care services.

During periods of increased foster care needs, private partnerships became much more important. To unburden government programs, local non-profits did more work on lower risk cases. Some foster children continued to move from family to family until they aged out of the program.

Despite being ruled unconstitutional, there were times when informal camps of immigrant children sprang up outside of the city. These experiences were damaging to children, and deportations were costly to the government left to care for the children without parents. By the mid-2020s there was comprehensive immigration reform which provided paths to citizenship but most of the deported were not allowed back.

Teen pregnancy rates continued to decrease in San Antonio, although racial disparities remained and the city hovered above the national average. These efforts and successes in reducing teen pregnancy rates in San Antonio persisted despite Texas law requiring abstinence only education in schools. Non-profits and other programs took the lead in sexual education and reproductive health.

San Antonio's major investment in Pre-K paid off. With voter approval for an increase in the city sales tax, the city created Pre-K 4 SA that serves about 10% of the city's 4 year olds (low and middle income families). The early experience found that in that year, students go from below the national average to above the national average in three of 6 tested areas (math, literacy and cognition); at the national average on oral language and social-emotional readiness, and that they have closed three quarter of the gap on physical skills. Pre-K 4 SA's presence and approach led to improved Pre-K in existing school district programs.

More students had success with reading at grade level in the 3<sup>rd</sup> grade, but inequalities remained. The system of multiple school districts became even more difficult to manage with the growth between San Antonio and Austin. Schools worked to minimize summer loss of reading skills by students. The requirement that all middle and high school students develop career or college plans had varying levels of success.

San Antonio continued and built upon their historical commitment to welcoming refugees, despite hostile state and federal policy. As the State of Texas did not appoint a federally funded refugee resettlement organization, San Antonio leaned even more heavily on non-profit providers and churches for aiding refugees. Resettlement services included microenterprise development and refugee agriculture partnerships. Refugee acceptance became an increasingly contentious political debate issue spurred by recurring conflicts in 2020s in the Middle East, Asia, and Africa. Refugee services were often stretched thin. Community members volunteered to deliver some services, such as informal language lessons.

## Disability Services 1

Local and state programs for people with disabilities included supportive housing, respite care for families of disabled, emergency response systems, and home and vehicle modification assistance. Generally, disability services grew more focused, benefit levels were reduced in the

late 2010s and 2020s, and eligibility requirements stiffened, even while the number of people with disabilities and their degree of disability increased.

In 2022, the Social Security Disability Insurance (SSDI) trust fund reduced benefit levels, and raised eligibility requirements, making it harder to get the benefits. In 2032, the SSDI trust fund regulated service levels by using the national outcomes research data base to assure only services with demonstrated success get reimbursed above maintenance level payments.

Diabetes was another source of disability. By 2030, diabetes affected over 284,500<sup>4</sup> in San Antonio, diagnosed and undiagnosed, disproportionately impacting minorities. By 2030, more than 30,000<sup>ibid</sup> people had a diabetes-related complication such as visual impairment, renal failure, or leg amputation.

New conditions such as increased opioid addiction, communicable diseases like Zika, and psychological trauma increased the number of people with recognized disability. Funding for opioid treatment increased during the late 2010s; however, access to treatment and success rates varied across race and socioeconomic classes.

Disability funding did rebound in the 2020s. Disability services evolved significantly by the mid-2020s as technology advanced; this included self-driving cars; intelligent digital assistants, 3D printing of smart prosthetics, home monitoring and home care robots. But many of these advances were costly and only covered by the best health insurance policies. Medicaid and Medicare covered some advances but not others, based largely on their costs. However, some widely accessible technological advances did help address isolation. Human service agencies helped customize the balance between technology and human interaction across integrated services for individuals.

## Food and Nutrition Services 1

Food and nutrition support programs such as SNAP evolved. Federal funding was decreased while need remained the same or increased, so community organizations scrambled to fill the gaps. Cuts to programs like WIC decreased the number of places, such as child care centers, where low income children receive daily meals. Fewer school children received school meals because of these limitations and higher barriers to qualifying.

SNAP moved to a block grant system, like TANF. Local health and human service agencies began coordinating their care and services with SNAP; as did state and federal programs. Community food banks and soup kitchens also checked with their customers to ensure that they were enrolled in SNAP, even as funding diminished 1% a year through the 2020s.

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<sup>4</sup> Institute for Alternative Futures, *Texas Diabetes Data and Forecasts*, <http://www.altfutures.org/pubs/diabetes2030/TEXASDataSheet.pdf>, Applying San Antonio as 5.4% of Texas population; with 5,270,100 total diagnosed and undiagnosed diabetics in San Antonio and 284,585 total diabetics in San Antonio. Accessed 25 January 2017.

Extreme weather events, such as flooding, increased across Texas and San Antonio. During these times, SNAP's demand increased and efforts were made to increase accessibility such as expanding income eligibility under disaster SNAP, loosened rules on which types of food could be purchased, and allowing schools to serve free meals to children evacuated from their homes. However, many of these disasters came during periods of reduced funding and less benefits to be flexible with.

As SNAP and other food program funding diminished, people were encouraged to produce some of their own food. Community gardens, often on public spaces grew, along with training in gardening. These were often near public housing and multiunit apartment buildings. Libraries also emerge as growing centers, operating as seed banks and giving classes around self-sufficiency technologies and tools. School's roles in food and nutrition expanded when possible, partnering with community based organizations to provide meals when funds were slim.

Prepared or semi-prepared meals were provided by community groups, even as federal funds for the Meals on Wheels program were cut. These local providers became more purposeful about the meals being nutritious and seasonal. However, these prepared meals were not always available and at times flooding and heat waves reduced the output of community gardens. And some efforts to increase nutritional value were resisted in favor of less nutritious but more familiar food.

## Housing Services 1

In San Antonio, the funding for low income housing remained largely from federal programs and there was variation of local direction across political periods and under different mayors.

SAHA had been providing housing for 27,000 families in San Antonio in 2015; 6,300 families in public housing units with federal funds for capital and maintenance costs; 13,400 families in Section 8 housing funded largely by with federal funds; and 6,800 families in subsidized non-profit or tax credit housing.

During the late 2010s, there were cuts to federal housing programs; however, tax credits for new construction remained. San Antonio developers competed vigorously for these tax credit generating projects. The State continued to promote construction of low income housing in "high opportunity" neighborhoods; at times to the neglect of place-based revitalization.

By the early 2020s, HUD changed the Section 8 voucher program to better reflect neighborhood variation, not simply metro area market prices. This led to greater variation in the payment level of vouchers depending on the area, which was determined by average rent in the zip code. The overall funding for the program fluctuated over the 2020s.

There were some greater measures taken across the nation to increase low-cost housing stock. San Antonio communities engaged some of these tactics<sup>iii</sup>:

- Rezoning to allow secondary living units on the property of single family homes and encouraging building on empty space around homes. This was met with some resistance and animosity, particularly in the suburbs
- Encouraging sustainable, energy efficient, low cost construction of units
- Conservation trusts, tax credits, and non-profit owned and leased units helped maintain affordability of land and homes
- Encouraging multifamily units that were livable and had a small ecological foot print
- Ordinances that prohibited landlords from refusing to accept housing vouchers as rent
- Encouraging alternative construction, including 3D printing of housing components and repurposed materials, and “tiny homes”

These policies were important and did lead to some increase in moderate and very low income housing over the years, but this still could not keep up with the demand as more families lost income as unemployment grew and the City’s population grew. Overcrowding increased throughout the region, as did homelessness and Colonia-type “model subdivisions” (particularly in the unincorporated areas).

San Antonio moved towards a “housing first” model, following the example of other Texan cities to help those who require substance abuse care and other needs. This required and facilitated greater integration between housing and other human services, such as substance abuse counseling. Emergency shelter in cases of abuse or neglect continued to be provided throughout the 2020s, though the need periodically exceeded the supply.

San Antonio homeless also benefited from Haven for Hope, a privately funded and run traditional homeless shelter that encourages personal transformation. It is a 36-acre complex of housing, food, medical and dental clinics, and a YMCA. It gets homeless off the street and empowers them get healthy, learn or enhance work skills and grow on to jobs and permanent housing elsewhere. With dormitory space for 850, it took that number of people away from living on the street. “Members” can stay for up to 2 years, though the average move comes after 6 months. Through the 2020s Haven for Hope maintained its impact in getting thousands of San Antonio homeless into jobs, better housing and healthier lives.

## Income Supports 1

Texas continued strict income support services and TANF regulations, such as low monthly cash benefits and barriers to access such as requiring that participants re-enroll in the program every three months. Other programs took this approach – all the while job loss to automation was making it less likely these recipients could get a job. Other benefits, including child care, were moved to tax credits, even while many who did get employment typically made so little that they paid little or no taxes, and so they got little benefit from these tax credits.

Politically, the ability to gain federal funds varied through the succession of administrations, Cuts were particularly strong under the 2017-2021 administration and partially rebounded under administrations in the 2020s, particularly as the Millennial generation entered leadership and

policy making positions. Total TANF spending grew in absolute dollars, though payments fell on a per-capita basis.

Texas did shift the “welfare cliff” with TANF, allowing a person to earn more income before they lost their TANF payments.

The need for income supports, particularly TANF and SNAP were repeatedly increased by extreme weather events effecting San Antonio, including dangerous heat and drought, and flooding. Damage to roads and transportation systems further prevented people from accessing employment after a weather event.

During these periods of environmental disaster, many human service workers found themselves without stable housing or access to food, and in the same position of need as many of their clients.

The refocus on empowering TANF recipients with education and skills training proved particularly important as the types and number of specific jobs available continued to shift due to increased computerization and the percentage of “gig work” rose. In San Antonio, areas of job growth included advanced manufacturing, cyber security, entry and mid-level health care jobs, and the green economy. Predictive analytics were applied to TANF recipients to match skills and local, sustainable, job opportunities.

## Scenario 2: (Challenging) Even Scarier

*In both San Antonio and the nation, human progress was repeatedly challenged. The need for human services grew, even though funding did not. The economy overall grew slowly for most of the two decades to 2035, with periodic recessions. The Great Recession of 2023 was particularly challenging to employment, tax receipts, and human service spending.*

*Life was impacted by the evolution from the internet, social media and smart phones, to virtual reality, artificial intelligence and cognitive computing. This had positive impacts, but also led to job loss to automation. There were recurring cyber security breaches, at times with costly shut downs. Although, cybersecurity threats had a silver lining - employment in San Antonio's cybersecurity companies went up.*

*Economic downturns led to an increase in self-sufficiency efforts, particularly family and community food production as well as the trading of services and other resources in low income communities. The historic practices of neighbors and families trading goods and services expanded. This increased the non-cash economy and the already relatively high informal exchanges in the region.*

*San Antonio had begun pursuing equity and health efforts in the late 2010s, but these efforts repeatedly faced great challenges. Despite some community resilience, across San Antonio, inequity (racial, financial, and otherwise) reached a boiling point and acts of violence and civil unrest periodically erupted. The failure to address inequity during the 2017-2021 administration and throughout the 2020s contributed to increased crime and animosity. This was ultimately very costly. People further segregated and isolated into their own communities. Human services likewise were hindered in their ability to successfully deal with the needs of many of these more isolated ethnic groups.*

*Climate change impacted San Antonio with extended periods of extreme heat and drought, along with occasional flooding. One of these floods proved to be a repeat of the 1998 flood (and the fourth "100 year" flood in 25 years!). San Antonio's aquifer was polluted by toxic run off from development in the recharge zones. This was exacerbated by the drought and flood cycle. Tourism was hindered by the continued high city taxes on hotels, but even more by the extreme heat and water challenges. Environmental disasters that displaced people while destroying homes and roads caused increased need for emergency income support and other services such as TANF and SNAP, housing services, behavioral health services, and child care. Many of these programs had been overwhelmed by demands, yet reduced in their spending during 2017-2021 administration. Community development block grants, which had previously provided flexible funds for cities to rebuild after a disaster, were cut completely in the late 2010s. Because of these emergencies, many human service workers themselves were displaced or otherwise in need of the services they were meant to be providing.*

*Many non-profit provider groups went bankrupt. As government funds were reduced, remaining community groups and churches were called on to do more despite their often-reduced donations. The hope and commitment of non-profits and faith-based organizations remained, but their ability to step up was limited.*



## Aging Services 2

As the Baby Boomer population aged, there was increased strain on health care and home care programs which faced budget cuts. Social Security payment levels did not keep pace with inflation and in some administrations, were slightly reduced. The political climate nationally and in San Antonio became more volatile.

Many senior services were cut; some were provided privately, including many important advances. The affluent could afford high tech and high touch home care, including effective home care robots that serve the elderly as caregivers and younger family members as aides. Low-income seniors were unable to access these new technologies as easily, and relied on familial relations for care which were sometimes strained as the economic downturn disrupted families. Some working-aged family members moved away from San Antonio to seek employment. When family members did fill the role of caregivers, there were often great emotional, financial, and physical impacts.

Cases of Alzheimer's and dementia increased in number as the Baby Boomer population aged. Diabetes related problems increased across seniors. The number of individuals in San Antonio aged 65 and older with diabetes was more than 70,000 by 2030<sup>5</sup>. The population with Alzheimer's in the San Antonio area reached more than 41,000 people by 2035. Low-income and Black and Hispanic populations were disproportionately impacted<sup>6</sup>. Problems of isolation and inability to access services and care exacerbated for elders with these conditions that live alone. Isolation, harm, and death increased during extreme weather events; in San Antonio drought, water scarcity, and dangerous heat often impacted senior population most harshly.

## Behavioral Health Services 2

The need for behavioral health services increased due to the stress and trauma of economic downturn and increased vulnerability, but the availability diminished year after year. Abuse of substances including opioids increased dramatically with growing harm to individuals, families and communities. Despite evidence showing that behavioral health care can counter the epidemic of drugs, funding became scarcer during the 2020s. Health care reform left more uninsured and there were cuts in Medicaid.

There were notable increases in drug dependency, poly-substance abuse and related co-occurring disorders. Access to treatment and success rate varied across race and socioeconomic classes.

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<sup>5</sup> Institute for Alternative Futures, *Texas Diabetes Data and Forecasts*, <http://www.altfutures.org/pubs/diabetes2030/TEXASDataSheet.pdf>, Applying San Antonio as 5.4% of Texas population. 1,343,200 total in the state of Texas over 65 had diabetes (diagnosed and undiagnosed) and over 70,000 in San Antonio. Accessed 25 January 2017.

<sup>6</sup> NPR, *Stress and Poverty May Explain High Rates of Dementia in African-Americans*, <http://www.npr.org/sections/health-shots/2017/07/16/536935957/stress-and-poverty-may-explain-high-rates-of-dementia-in-african-americans>



Behavioral health expert systems – “virtual counselors”, delivered via smart phones, did become very effective by the mid- 2020s. They were available to the affluent, those with expensive health insurance, and to the few low-income folks still on Medicaid managed care plans (these plans provided the app to their patients without charge).

Prisons remained major sites for providing behavioral health services, with wide variations across facilities in the quality of the behavioral health provided. From 2017-2021, the return of a “get tough” stance in criminal justice led to increased arrests and convictions. Black and Hispanic populations were most affected because their arrest rates remained higher and their sentences longer than for the White population. The Great Recession and other economic challenges increased poverty, contributed to higher crime rates, and continued high incarceration rates.

In 2020s, human services did use predictive analytics to help behavioral health providers triage the population when budget cuts meant people must be cut from programs. These cuts took a toll on providers as well as their clientele.

## Child and Family Services 2

The need for child and family services grew for most of the two decades to 2035. Increased poverty, racial and ethnic disparities, and cuts to human services were among factors increasing need. There was a reduction in many non-crisis services. Although these ultimately save money, they could not be prioritized as San Antonio struggled to meet day-to-day demands. The cuts in services experienced in the late 2010s were largely reversed by 2023, when the Great Recession 2023 arrived. Job loss to automation added to the growth of poverty throughout the 2010s and 2020s.

Increased poverty contributed to greater child abuse and neglect, domestic abuse, opioid and other substance addiction, teen pregnancy, housing insecurity, food insecurity and depression. These contributed to adverse childhood experiences (ACEs) and trauma which impacted brain function and development for these children, which would negatively affect their gene expression for years to come. The community’s commitment to the SA2020 goals slowed some of this movement, but ultimately, the need for foster care grew. Foster care providers varied widely in their quality with some providers giving inadequate service or even endangering the children in their care. Cases of abuse in foster care systems grew throughout the 2020s. Many children entered the welfare and foster system in a period that saw funding cuts. Some of the children entered the system because their foreign parents had been deported. Child protective service workers became increasingly overworked and strained through the 2020s. Worker retention rates were low. Social service providers adopted automation of tasks to deal with staff cuts, and in 2035 there are fewer people who meet directly with children and families.

Adult protective services and refugee assistance services were cut repeatedly. Other programs that experienced cuts, or elimination, included: child care subsidies, programs to provide school clothing, transportation assistance, home repairs funding, and job training. In San Antonio faith-based, philanthropic and other community groups increased their efforts to address some of these

unmet needs. And human service providers encouraged family self-sufficiency through home and community food production; trading time and services; sharing 3D printing for making many of the things they need.

While Pre-K 4 SA centers and their influence helped raise kindergarten readiness for low income kids, the gap in student achievement between schools was worsened. This continued and exacerbated the disproportionate outcome of funding, graduation rates, and academic success. The greater metropolx that developed as San Antonio and Austin regions merged complicated school district management.

Participation in the informal economy (sometimes in illegal activities) increased as more families were excluded from the formal economy and services. San Antonio further developed as a hub for child trafficking. Through the 2020s and 2030s the victims of these crimes required special services and trauma-informed care that was not always available to them.

Despite these challenges, there were instances where neighborhood and community networks built resilience and developed informal systems for child caring, meal sharing, and spreading information about the services that do remain.

## Disability Services 2

Budget stress brought about increases in disability payroll taxes, reductions in federal Social Security Disability Insurance (SSDI) payment levels, and tougher eligibility standards. The percentage of people with disabilities grew- particularly those related to diabetes- fueled by higher structural unemployment, more severe weather events, and growing chronic disease; in addition to a major economic recession in 2023. Developmental disabilities grew in the 2020s, fueled by parental drug abuse, lack of prenatal care and spread of the Zika virus and other diseases. State and local services for people with disabilities- which include housing and home modification assistance, transportation services, and job services- were also negatively impacted.

Accident-caused disabilities continued to grow. Deregulation of some businesses led to increased contamination of water and soil in some communities, which led to increased disease and disability. While some congenital conditions could be addressed in utero, and some after the person was born, these were expensive procedures, not covered by Medicaid and Medicare.

Veterans increased in number due to ongoing conflict and war. However, those returning, former veterans, and their families were often unable to access health care as the military doctors were deployed to warzones and the Veterans Administration's funds were reduced. There were fewer physicians and other disability/rehab providers in the area as those jobs became less lucrative career due to high cost of malpractice insurance, intense billing and payment requirements, and lower Medicaid reimbursements. San Antonio continued to lack specialists.

Furthering the strain on people, more doctors refused to accept Medicaid payments. Medicaid recipients themselves faced greater barriers to access such as mandatory reapplication every several months, and stricter limitations to specific services.

There were technological and medical advances that removed disabilities or lessened their impact, but most low-income people lack access as Medicaid and Medicare do not cover them or their families cannot afford them (e.g. advanced digital assistants, self-driving cars, 3-D printed prosthetics and orthotics, home robots, and neuro-enhancements). For example, in San Antonio, a rehabilitation hospital in the city offering state of the art nerve stimulator technology in the late 2010s allotted only 2% of their 300 hospital beds for patients using Medicaid benefits. Some other hospitals took no Medicaid rehab patients. These restrictions grew in the 2020s.

Parental drug abuse and lack of prenatal care contributed to higher developmental disability rates in the 2020s. The ability to lessen the impact of intellectual developmental disabilities decreased as special education funding and the number of specialized teachers and therapists were reduced. The racial and income segregation in the city persisted, and drove further inequality as students with greater educational and medical needs who live in higher income communities received services while many in low income communities did not.

## Food and Nutrition Services 2

The severe economic recession in 2023 further exacerbated food insecurity- but unlike in past recessions, federal spending for SNAP benefits could not rise with the need. Despite obstacles, organizations such as churches and non-profits across San Antonio repeatedly increased their nutrition programs or funding, particularly in schools and early childhood centers.

SNAP benefits moved to a block grant, which was yearly reduced in size until the program ended in the late 2020s.

Home food production increased, along with community gardens and other forms of community co-production. Many schools maintained gardens. By the mid-2020s there was increased home fruit and vegetable production; many of these efforts were in low-income communities, and focused on knowledge sharing and encouraging home gardens. Food insecurity and hunger persisted and impacted education, health, and economic development.

Economic recessions, particularly the big one of 2023, drove some grocery stores out of business, which limited the options for food purchase. Public transportation was increasingly strained. The number of San Antonio residents in food deserts grew in the 2020s.

Periods of severe drought and storms hurt food production on the more than 2,000 farms in the County as well as the growing number of home and community gardens. Aquifer pollution and other challenges and related water shortages, as well as reduced air quality periodically further reduced production or the quality of the foods.

## Housing Supports 2

Housing assistance had been declining from the mid-1990s to 2015. During the 2017-2021 Administration, funding to housing services was cut further. For families, job loss was a frequent

cause for loss of housing. This accelerated during the Great Recession of 2008. Other contributing factors to housing instability increased as well including, the severe cost burden for rent, and increases in domestic violence and disabilities. Large numbers of people lost their homes while human services had little to offer in response. Homeless populations soared while spending on them dropped. Churches in many areas of San Antonio stepped in temporarily and met some of the need, providing shelter and meals. Homeless camps arose or expanded in the City and County. Overcrowding in homes and apartments increased throughout the region, as did blight, homelessness and Colonia-type developments, often bringing with them increased rates of crime.

While housing services decreased and homelessness increased, many community members had used up their lifetime eligibility for programs such as TANF and SNAP. This left some without the ability to meet their basic needs. When state funds were provided for housing, there were strict mandates and a focus primarily on the mobility model, in which families living in high-poverty areas move to low-poverty areas using subsidies. This method was met with resistance and periods of gridlocked funding and action.

The availability and quality of low income housing declined dramatically. HUD stopped or dramatically reduced much of its public housing and housing subsidy programs during the 2017 to 2021 Administration. City and state funds were not able to make up the difference. SAHA had been providing housing for 27,000 families in San Antonio in 2015<sup>7</sup>; 6,300 families were in public housing units where the federal funds for capital and maintenance costs roughly remained level. This was inadequate for maintenance and led to some units and buildings to be taken out of service. Section 8 housing voucher funding slowly declined, dropping from 13,400 families to 8,000 by the late 2020s. 6,800 families had been in non-profit or tax credit housing in 2015 – that number likewise decreased.

## Income Supports 2

Texas continued to be very restrictive income support services, such as with cash benefit amount and time limitation on TANF benefits. These limitations were made more extreme during periods of federal cuts. When jobs were available, racial discrimination persisted among hiring, or many people had criminal records which made them less hireable. Single parent households, increasingly the norm for low income families, were less able to meet their basic needs, and resorted to extreme measures, did without, or found alternative sources for food, shelter and services. The 2008 Great Recession pushed more families below the poverty line. Multi-generational homes increased. Through the 2020s a growing number of the population in prison are former TANF recipients who resorted to crime for survival.

Texas experienced water scarcity, water pollution, extreme heat and drought which increased the need for assistance. Widespread opioid use, and social unrest left more families in poverty and unable to meet their basic needs. Other problems such as increased infant mortality, decreased high school graduation rates, and increased family homelessness further stressed the situation.

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<sup>7</sup> SAHA, <http://www.saha.org/index.php/current-residents>

Access to jobs was hindered as transportation funding from the federal government, the state and the city was reduced. Some major road projects were cancelled and road maintenance declined. Many low-income families needed public transportation to get their jobs – but some bus lines had to be dropped. Uber and similar services increased, as did self-driving cars and trucks, reducing some demand for public transport. But the cost for these remained out of reach for many low-income families, leaving many isolated from the lesser number of available jobs.

## Scenario 3: (Visionary) Fiesta

*There were transformations across Texas and the nation taking place in the economy, values and policies that led to major changes in the 2020s. San Antonio led many of these transformations. These were accelerated by the challenges during the 2017 to 2020 Administration when the economy grew, taxes were reduced especially on the wealthy; job loss to automation increased as did poverty and inequality; while funding for low income programs was cut.*

*The economy overall continued to grow slowly with major shifts in employment. A net 7% loss of jobs to automation by 2025 was followed by greater job loss in the years to 2035<sup>i</sup>. Much of the remaining paid work shifted to consulting or piece work on the “gig economy”. Manufacturing evolved as home goods, electronics, and even food could be 3D printed locally or in your home.*

*Simultaneously, values and attitudes shifted. Equity and inclusion became the norm in most communities across Texas and the nation, with San Antonio as a leader. The 2017-2020 Administration’s policies and parallel growth in inequities set up major changes in the 2020s. Human Services and human progress were redefined and transformed through a national and local focus on equity. Republicans, Democrats, and Independents joined in voting for candidates supporting changes, as did low income adults in much greater numbers than ever before. Policy changes were put in place in taxation, universal access to health care (Medicare for All), public safety, education, and the environment. Given the rising structural unemployment, including the loss of many middle-income and high-income jobs to automation, an unconditional Guaranteed Basic Income (GBI)<sup>iv</sup> for all citizens was put in place. This income largely eliminates cash transfer programs, such as SNAP, TANF, and others, but positively impacted most communities as families gain stability and some independence.*

*San Antonio was a leader in equity. Equity as a value was integrated into the community and government departments and operations. SA2020 led conversations and action around equity and accountability. Budgets for the City were restructured to better and more equally address need.*

*Measures were identified and pursued for several equity indicators, including: increased voter turnout; reduced emergency response times; reduced crime rate, improved satisfaction with community safety; increased downtown housing units and employment; increased per capita income (GBI plus); improved 3<sup>rd</sup> grade reading and high school graduation rates; reduced poverty; reduced obesity and diabetes; improved access to green spaces and increased use of renewable energy.*

*There were advances in technology that made living less expensive. Low cost solar energy production and storage, enabled by breakthroughs in solar panel efficiency, in alternatives to lithium for battery storage, in material advances that allowed needed electronic and other components to be manufactured from abundant raw materials. Food production was enhanced in urban agriculture, community gardening and in-home food production. Aeroponics and other technology supported vegetable growing. Cultured meat and protein joined 3D printed food, increasing access to sustainable protein sources. Beyond food, 3D printing, or distributed*

*manufacturing, allowed families to manufacture many of their needs. Some 3D printing was done at the local library, others at the successor to the Kinko copying store, and still others in homes (with the use of the 3D printer shared among neighbors). These advances supported self-sufficiency and were often looked on as “abundance advances.”<sup>v</sup> In addition to having the basic income residents and their neighborhoods produce and co-produce many of their needs. This self-sufficiency is aided by the availability and effective use of “abundance advances.”*

*Demographics in Texas and San Antonio changed, as did political leadership and policy. The leadership of San Antonio continued to be younger, with more Hispanic and other ‘minority’ representation. Equity in education led to the consolidation of districts into one unified school district for the San Antonio area.*

*The information and communication environment changed. The successors to smart phones and their related apps expanded their services and became more intelligent. Data aggregations enabled predictive analytics applied to many aspects of life. People were educated around data sharing and using and given control of their own information. Cognitive computing, the driver of automation of many jobs and tasks, served families and individuals in doing home security, language translation, directing self-driving cars, and providing health care diagnoses and prescriptions. Virtual reality became widely used, including by elders.*

*Human Services were shaped by and often accelerated these transformations. After cuts and rebounds in the early 2020s, human services continued its movement to the generative business model of the human services value curve. Two-generation and multi-generation strategies were consistently used. The goal of human services moved from getting families to be self-sufficient to supporting their wellness and thriving. The need or demand for human services were somewhat reduced as the GBI reduced poverty; there was less child and elder abuse; healthier living slowed or prevented disease and some disabilities. But needs for services persisted. To optimize human service delivery, automation was applied as appropriate. Predictive analytics allowed human services to anticipate a family’s needs, optimize services for the family, identify and foster the most effective community partnerships, and, when needed, to triage among programs or clients when funding or services were being reduced.*

*Human services provided training on the wealth and financial literacy needed for families to successfully manage their guaranteed basic income, to optimize their use of “abundance advances,” and to have each family member pursue their contributions to the community. Having a sense of your worth, and your contribution, along with taking care of children, the elderly, volunteering in other settings helped reduce diseases of despair (including suicide and substance abuse.)*

### Aging Services 3

SA2020, then SA2030 promoted activity, healthy living, and increased community involvement. For older adults in the San Antonio area this had a beneficial effect of slowing their aging, disabilities, and chronic diseases.



For aging services, there was greater integration of data across various aging services- such as those addressing housing and nutrition- with overall health and well-being. The ability to address physical, social and spiritual needs of people up to and through their dying days meant old age was a good time of life for a growing number of people. Human services aligned with human progress in their goal: everyone can contribute to their community and no one is without a sense of purpose, even in their later days.

Formal, informal, and virtual senior centers all grew, while many ceased to be “seniors only” centers. Most communities increased their senior activities and integrated senior services into libraries, schools, churches, cafes, and other settings, including homes and neighborhoods. Seniors spend more time volunteering and trading goods and services.

Senior group living and co-housing grew steadily through the 2020s, as did “smart homes” for many seniors. Smart home features play many roles- a friend, bookkeeper, secretary and counselor. Many smart homes support in-home food and energy production.

Senior housing and centers were influenced by several technological and community changes. These efforts included:

- Integrating health and human services
- New buildings and those retrofitted are energy efficient; universal design widespread
- Transportation was made easier with self-driving cars and other advances
  - The SA 2020 and 2040 plans were largely successful in realizing their transportation agenda adjusted to integrate self-driving vehicles into the public transit system

Virtual reality and remote participation became increasingly easy, as even those in their 70s and 80s spend time in virtual reality. Much elder health care was done remotely or in VR, but when face-to-face doctor visits were needed, most often the transportation cost was subsidized by the City, County or the health care provider. In addition, public transport was influenced by the successes of private systems such as Uber and self-driving cars.

Nutrition programs, such as SNAP payments, were eliminated after a basic guaranteed income was implemented in the 2020s and adjusted for those receiving Social Security payments. Programs such as Meals on Wheels charged recipients, given their GBI payments, with only special categories of individuals, e.g. the disabled, whose meals remained free.

### Behavioral Health Services 3

Many behavioral health problems were prevented in the 2020s as all families had a guaranteed basic income, and lowered their cost of living through low cost solar energy, home and community food production; 3D printing of many needs. This better addressed some of the root causes of behavioral health problems. In parallel with the self-sufficiency gains and social value shifts there was an increase in behavioral health literacy that destigmatized getting behavioral care. This led to much greater acceptance of differences among people and of people seeking treatment and being able to talk about it.



Technology significantly accelerated behavioral care; effective and inexpensive software developed and used by leading health care providers proved to be very successful in the 2020s. In addition, the intelligent agents that Apple, Microsoft, and Google had built for years could also be instructed to give behavioral care. These programs were kept updated as information evolved.

These technologies did not replace interpersonal counseling and care, particularly for those with long-term and more severe mental illnesses. The balance between human and tech delivery was customized for each person.

Behavioral health services were influenced by advances in understanding ACEs and genetic and environmental contributors to behavioral health. Predictive analytics aided early intervention. For some behavioral health conditions that were largely genetic in their origin, in the 2020s effective genetic interventions were proven successful. The Medicare for All system covered or provided these advances. Better understanding of gene therapy helped prescribers have much more accuracy with prescribing appropriate behavioral health medication. Most prescription medication users had faster more successful responses as a result. Physical and behavioral health were given parity.

Some insurers offered discounts for those that pursued behavioral health care. Non-traditional services such as meditation, yoga, and exercise increased. Primary care involved early screening for known markers of behavioral health, and there is increased early intervention.

Homes for adults with behavioral health issues evolved with special smart home technology geared to residents' needs. Residents do home food production (from conventional gardening to high tech approaches); use face to face visits and virtual reality to relate to other communities; and generally, make themselves as self-reliant as possible. Some called these Freedom Homes. Health care and human service agencies supported social enterprises that develop and manage these homes.

### Child and Family Services 3

The pursuit of the SA2020 goals of reducing poverty, child abuse, domestic violence, underemployment, teen pregnancies, and homelessness, while increasing per capita income, kindergarten readiness, 3<sup>rd</sup> grade reading levels, maternal and child health, were extended to 2035, and along with the SA Tomorrow 2040 goals, were largely achieved.

Guaranteed basic income payments were consistent and led to greater family stability, a reduction in domestic violence and child abuse, and contributed to lower teen pregnancy rates and increased high school graduation rates. GBI support led to volunteering by those not doing paid work; all contributed. Abundance advances lowered the cost of living and helped provide family security as families used low-cost energy and storage, produced some of their own food, 3D printed in-home or in-community some of their home goods, lowered the cost of living and helped provide family security.

The commitment to equity and inclusion in San Antonio made low-income and minority children and families feel less isolated and part of the community. The development of more mixed income neighborhoods physically integrated families. All of this effected the emotional, physical and economic wellbeing of children and adults, reducing domestic violence and child abuse.

But while reduced, opioid and other substance abuse and addiction and behavioral health issues (including the effects of ACEs experienced in the decades before) persisted, giving rise to ongoing, if reduced, need for children, youth and family services. The GBI payments helped more families to take foster children, while aiding extended families and enabling more kinship placements.

Human service providers enhanced their partnerships with health care, public safety, education, and the business community. Protection of data security, identity and from discrimination, enabled integration of data and advanced analytics applied to that data. These served to identify at-risk individuals, vulnerable communities, and specific circumstances that prompt preventative actions. And those analytics identify the most appropriate services for each family member. Throughout the 2020s these services were rigorously evaluated for outcomes, enabling both quality improvement and cost reduction in the human services delivered. San Antonio was a national leader in many aspects of child services and in ensuring data was collected and used with consent.

Immigration was made more difficult during the 2017-2021 Administration, Federal support payments were reduced, and deportations increased. In the 2020s the U.S. returned to being an immigrant and refugee friendly nation. Immigration reform took place in the 2020s. Political and economic stability at home allowed the United States to successfully welcome significant numbers of refugees throughout the 2020s. Services for these individuals and families came from federal, state, local, and private programs with blended funding streams. Where refugees had children born in the US, as citizens, they received the child's GBI payments. The isolation of immigrants and refugees and their service providers and neighbors was somewhat reduced using effective, low cost, culturally sensitive language translation apps.

### Disability Services 3

Disability, or its impacts, were reduced during the 2020s. The slowing or reversal of chronic diseases, particularly diabetes, arthritis, Alzheimer's, and some cancers; physical activity and weight loss among overweight and obese individuals; safer and healthier work places and work styles all contributed to the reduction. Developmental disabilities were reduced somewhat with reduced poverty, consistent prenatal care, and safer environments.

Disability payments were affected by the implementation of the guaranteed basic income in the 2020s. These unconditional payments reduced, and in some areas eliminated, disability payments. Some individuals with severe disabilities (i.e.: they are dependent on costly caregivers) were eligible for disability payments in addition to guaranteed income. These

additional benefits operated on a gradient of severity, similarly to the worker's compensation system.

Health and human services became more integrated both with sharing data and developing partnerships across all levels of delivery. Several systems followed the successful example of a San Antonio Autism Life Links, which linked multiple organizations and allowed clients to enter through a central portal, where information is appropriately shared. Clients were guided to best care practices. When carefully done, this brought about several positive results. Mental and developmental disability screening took place with primary care exams, and became less stigmatized. This increased the number of people in need who sought and received care. Across San Antonio school districts, a more cohesive policy plan was developed and put into practice which more equally and efficiently provided disability services for children.

There were remarkable medical and technological advances affecting disabilities, including:

- 3D printing of home equipment and even smart prosthetics
- Sophisticated home monitoring and home care robots
- Friendly intelligent agents that act as helper, guide, counselor, therapist, translator, speech and hearing enhancer. These personal intelligent agents also communicate with family members, care givers and medical personnel about their person with disability
- By the mid-2020s direct brain control of limbs for paraplegics was available; reversal of diabetes and Alzheimer's; and vision and hearing restoration for some
  - As the medical advances were proven effective and safe, and their initial costs dropped, they were covered Medicare for All.
- By the late 2020s genetic analysis could predict disabilities and in utero testing and gene level repair was available in some countries.
- Diseases such as sickle cell disease, fragile X disease, retinitis pigmentosa, and others which are due to an abnormal gene, became treatable or preventable. There was also progress in treating conditions caused by gene duplication, such as Down Syndrome. Many of the causes of disability, beginning in childhood, progressed towards being preventable. Treatment for additional genetic diseases such as schizophrenia, type 1 diabetes, and other chronic diseases evolved (likewise for cancer care).
- Self-driving cars and other vehicles increased mobility.

Many of these were available to low income individuals and families either because they were sufficiently low-cost, or because they are covered by the universal health care system. Racial, ethnic, and income disparities in disabilities and their treatment were lessened.

### Food and Nutrition Services 3

Food insecurity was significantly reduced by the guaranteed basic income payments and by families and communities producing more of their own food, including:

- Self-production of food in homes

- Community co-production, including community gardening, and advances in hydroponics, aeroponics, and urban and vertical agriculture
- 3D printed foods, and cultured meat.

In addition to technology, many areas built upon San Antonio’s agricultural heritage, tapping into the knowledge of elders to re-teach home gardening, food culturing, and small-scale agricultural practices. The role of food in forming community and spiritual connection with others was recognized as an important facet of providing people with security, and this was celebrated in community programs and supported by state and federal funding agencies. Universal Pre-K was adopted and most sites, as well as schools, included a gardening component and education on nutrition. Food preparation and production grew in public, private, and nonprofit sectors.

Basic income provided a floor for family income, and displaced SNAP payments, allowing better access to their basic needs. Human services, schools, and health care shared data and allowed individualized and preventative approaches to addressing food and nutritional needs.

### Housing Services 3

Although San Antonio was historically not a “high cost” city for housing, housing costs had been growing faster than wages and this continued in the 2020s. The GBI payments helped many pay the rent, but seldom was rent less than 50% of their GBI monthly payment. The need for low income housing grew. Changing attitudes supporting equity and inclusion in the state, the recognition of housing as a fundamental need, and effective leadership enabled policy and program changes that significantly increased the low-income housing stock in the region; much of it in mixed income neighborhoods.

In San Antonio, the funding for low income housing remained largely from federal programs and there was variation of local direction across political periods and under different mayors.

SAHA had been providing housing for 27,000 families in San Antonio in 2015; 6,300 families in public housing units with federal funds for capital and maintenance costs; 13,400 families in Section 8 housing funded largely by with federal funds; and 6,800 families in subsidized non-profit or tax credit housing. Under the 2017-2021 administration, there were cuts to federal housing programs; however, tax credits for new construction remained. San Antonio developers competed vigorously for these tax credit generating projects. The State continued to promote construction of low income housing in “high opportunity” neighborhoods; at times to the neglect of place-based revitalization.

After cuts during the 2017-2021 Administration, there was a rebound in Federal funds to build and maintain public housing and for section 8 vouchers. And San Antonio took a variety of measures to increase the low-income housing stock:

- Encouraging sustainable, energy efficient, low cost construction of units, both multifamily and individual new homes, and accessory dwelling units

- Conservation trusts, tax credits, and non-profit owned and leased units helped maintain affordability of land and homes
- Encouraging multifamily units that were livable and had a small ecological foot print
- Ordinances that prohibited landlords from refusing to accept housing vouchers as rent
- Promoting the growth of accessory dwelling units, to foster mixed income neighborhoods, at first consistent with the 2015 San Antonio's ordinance on ADU's, but later expanding the areas where they could be developed and lessening other restrictions.
- Promote the use of abundance advances to lower the household's cost of living

San Antonio moved towards a “housing first” model, following the example of other Texan cities to help those who require substance abuse care and other needs. This required and facilitated greater integration between housing and other human services, such as substance abuse counseling.

Emergency shelter in cases of abuse or neglect continued to be provided throughout the 2020s, though the need periodically exceeded the supply.

San Antonio homeless also benefited from Haven for Hope, a privately funded and run traditional homeless shelter that encourages personal transformation. This 36-acre complex has housing, food, medical and dental clinics, and a YMCA. Haven for Hope got people housed and aided them in achieving health and work skills towards jobs and permanent housing elsewhere. Through the 2020s it moved thousands of homeless into more stable conditions.

Housing services in the City and County were well integrated, consumer focused, and used predictive modeling and advanced analytics to anticipate emergency housing needs. Social impact bonds, or “pay for success” models, increased as data supported their success. This model was applied to housing. People without stable housing, or in areas of concentrated poverty, tended to be high users of very costly services such as emergency rooms. Stabilizing homes and communities saved money across the board. And housing services used the mobility model, encouraging families to move from low income to moderate income areas. Social impact bonds encouraged this, because it was shown that when participating in a mobility model, families that move from low income to moderate income areas saw an improvement in health outcomes. This was ultimately cost effective, and so a better case for funding impact bonds.

There were actions to both build affordable units in high opportunity neighborhoods and to revitalize areas that had been neglected. SAHA helped stimulate the creation of a real-time marketplace of all available housing units, organized by price, geography and unit size. Cross-sectoral partnerships helped build housing for low income families, e.g. hospitals supporting the funding or loans.

Families and neighborhoods were strengthened through abundance advances, which included affordable options for climate-resilient homes, and the home and community production of food and energy. The City and federal housing regulations and incentives led landlords to equip their rental units with low cost solar energy and storage and pass the savings to renters.

Homelessness remained, but was drastically reduced. The basic income served to alleviate portions of chronic homelessness, but crisis related homelessness (due to environmental emergencies, violence, or behavioral health) remained.

### Income Supports 3

With the passage of the guaranteed basic income, TANF was largely eliminated along with SNAP, EITC and other income support programs, except when natural disasters brought emergency needs. Some programs such as housing subsidies and disability payments where the costs or needs exceeded the GBI payment levels, were continued. Yet in most cases, guaranteed income payments enabled the disabled to have better lives in which they contribute to their communities and society.

San Antonio was intentional about creating a network in which people could better participate in the community. People volunteered, or cared for children and elderly. Given the GBI payments for those not otherwise doing paid work, this contribution and the sense of meaning that accompanied it, was needed.

## Scenario 4: (Visionary) SA 2020 Realized

*The 2020s saw accelerated change in attitudes, economics, and policies. The 2017 administration had ridden into office on discontent with the economy – but little was done for those long unemployed and those newly unemployed because of automation. The economy grew during the late 2010s as did unemployment, income inequality, and gridlock in Washington. That set up transformations in policies and regulations in the 2020s driven by major value shifts for health care, education, housing, public safety, and income supports saw transformations.*

*Simultaneously and for the first two decades of the 21<sup>st</sup> century, a deeper value shift toward more empathy, equity and inclusion had been growing. This led to public support- nationally and in San Antonio- for new policies, regulations and community changes.*

*Job loss to automation accelerated and technology continued transforming the nation and San Antonio – from information, social media and communication, to manufacturing, food and health care.*

*One class of technologies lowered the cost of living and enabled families to become more self-reliant. These “Abundance advances” provided low cost energy, highly productive in-home food growing, and local manufacturing (3D printing) of many home goods and electronics. For new housing, local materials were fed into 3D printers to produce the components for rapid construction of quality, lower cost homes. Low cost solar and other renewal energy as well as in-home and in-community energy storage was widely installed in Texas in the 2020s. Policies promoted the spread and use of these abundance advances – for example, providing incentives and requirements for landlords to install and use low cost energy and share the savings with their tenants.*

*SA2020’s and 2040 goals had reflected the shift toward a wellness and sustainability model which guided human services towards fully addressing the physical, mental, and emotional well-being of individuals and families. Human services became more integrated, automated, efficient and effective. Programs were integrated across Federal, State and local levels, with accelerated eligibility determination and enrollment, integration of data across agencies and sites (e.g. school, work, medical care), and customized care with predictive analytics.*

*San Antonio was a leader in equity. As inequity across districts of the City was better discussed and understood<sup>8</sup>, equity as a value was integrated into governmental departments and into the community. SA2020 led conversations and action around equity, accountability and meaningful action. Budgets for the City were restructured to better and more equally address need. Measures were identified and pursued towards several equity indicators, including: increased voter turnout; reduced emergency response times; reduced index crime rate, improved satisfaction with community safety, increased downtown housing units and employment, increased per capita income, improved 3<sup>rd</sup> grade reading and high school graduation rates,*

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<sup>8</sup> City Councilwoman Shirley Gonzales, Street Maintenance and Pavement Preservation Programs Report, June 16, 2017



*reduced poverty, reduced obesity and diabetes, improved access to green spaces and increased renewable energy. Improved outcomes strengthened San Antonio's communities.*

*The equity movement impacted human services, as stigma around receiving services was decreased and support for them was increased.*

*Human services have adequate funds, including higher pay for the reduced number of human service staff and adequate overhead for human service provider organizations. Each client has a case manager/mentor who ensures they get the most appropriate services as well as support and encouragement towards wellness.*

*Many aspects of human service tasks were effectively delivered via virtual reality, smart phone apps and their successors in the 2020s. Smart phones and adequate internet were universally accessible. Human service workers specialized in providing human touch when needed and in doing quality assurance for the automated services.*

*Job training in San Antonio focused on skills needed in jobs or gig economy work that would not be automated. San Antonio created jobs in biosciences, aerospace, and the green economy.*

*Data integration progressed towards shared data bases, which strengthened the 'no wrong door' approach. Privacy, security, and consent are critical for these information systems. Although policy and ethics at times lagged technology, San Antonio remained committed to the integrity of these systems and their clients. Each person had their own comprehensive record and the ability to let agencies in, and be excluded from, this information. People were educated about what this record means, how it can be used, and how they can control that.*

#### Aging Services 4

By 2035 there were over 410,000 aged 65+ in the County, including retirees who stayed in the County and others who retired there.

Major advances in treatment and prevention of Alzheimer's and diabetes, prosthetics, biomonitoring and home care technology. Most are available through Medicare.

The city successfully expanded and enhanced transportation (including using self-driving vehicles), built more affordable housing (including accessory dwelling units), expanded healthcare, and embraced new concepts for senior homes and villages.

Formal, informal, and virtual senior centers all grew, expanding nutrition and activity opportunities for seniors. Most changed their names to community centers and engaged multiple generations- integrating senior services into libraries, schools, churches, cafes, and other settings. As computer games and virtual reality evolved, human service providers fostered senior gaming and networking. Seniors share and trade services, time and goods in the community. This included providing baby-sitting, tutoring or mentoring kids, senior assisted living services, in-home care services and light house cleaning.



Tele-health, virtual reality care, advanced bio-monitors, smart home technology, and secure data bases all helped advance care for seniors. Senior group living and co-housing grew steadily through the 2020s, as did “smart homes” for many seniors. This made exchanging services within group housing easier, while smart home features play many roles- including friend, bookkeeper, secretary and counselor.

The minimum wage for caregivers, as with all workers, is a living wage by 2025. Caregivers are better trained, aided by technology.

#### Behavioral Health Services 4

Behavioral health needs, both routine conditions and severe mental illness, grew more slowly in the 2020s as value shifts led to great inclusion and equity, reducing stress. Challenges remained, as did need for behavioral health services.

In the 2020s, universal access to health care (Medicare for All) was put in place with full integration of behavioral health with medical care. The societal value shifts toward inclusion and equity were palpable in the 2020s and touched many low income and marginalized communities – removing some of the social isolation they felt. In parallel with self-sufficiency gains and social value shifts there was an increase in behavioral health literacy that destigmatized receiving behavioral health care.

Big data and predictive analytics were pioneered in San Antonio, and this greatly advanced behavioral health services. Data was collected and used with full consent and consistent privacy measures. Data guided prevention efforts and aided understanding pharmaceutical combinations and their impact. Better understanding of gene therapy helped prescribers have much more accuracy with prescribing appropriate behavioral health medication. There were more psychiatrists, and more doctors that were trained and able to prescribe needed psychiatric drugs. Artificial intelligence, “Doc Watson” for behavioral health advised psychiatrists and primary care providers on behavioral health issues, and by the mid-2020s were operating as “virtual counselors” to patients whose conditions were more routine. There were treatment advances in the 2020s that were applied very rapidly.

These included better understanding of the effect of adverse childhood experiences on gene expression and behavioral health. For some behavioral health conditions that were largely genetic in their origin, in the 2020s effective genetic interventions were proven successful. The Medicare for All system of the 2020s covered or provided these advances. Better understanding of genomics helped providers have much more accuracy with prescribing appropriate behavioral health medication.

Data integration and better partnerships allowed behavioral health providers and schools to coordinate and determine if a preventive intervention was needed. Providers and schools shifted towards a more holistic approach to wellbeing. Schools used yoga and taught mindfulness to

empower students to enhance their mental wellbeing. And they taught students to understand mental stabilizers – like getting enough sleep and eating healthfully.

Families were assigned a third-party case manager- sometimes this was a virtual counselor.

Houses of worship played a fundamental role in the mental health community across San Antonio, and their staff was trained to identify and discuss risk factors. Some churches expanded their role with wrap-around care and developed meaningful relationships with other providers. Churches had previously offered support groups for those in substance abuse recovery. These expanded to those recovering from different problems.

#### Child and Family Services 4

The pursuit of the SA2020 goals of reducing poverty, child abuse, domestic violence, underemployment, teen pregnancies, and homelessness, and energy use, while increasing per capita income, kindergarten readiness, 3<sup>rd</sup> grade reading levels, maternal and child health, were adjusted and extended to 2035 and were largely achieved. Likewise, the 2040 goals that added sustainability and encouraged equity were nearly all achieved by 2035.

Children, youth and family services evolved, driven by national, state and local equity movements. San Antonio made strides in addressing segregation. Community leaders and members became intentional about reducing the opportunity gap approaching all human service work in a culturally sensitive way. Need for child and family services was also influenced by the rise of the minimum wage to a living wage and abundance advances which helped provide greater family stability.

Human services used predictive analytics in coordination with schools to anticipate needs for children and their families. Community health workers, some paid by human service agencies or non-profits, some working as volunteers, but all from the local community played an important role in providing and coordinating services. This helped build trust and develop community networks.

While the living wage pulled those families with full time workers out of poverty, it also sped up job loss to automation and the shift to “gig work”. San Antonio experienced high employment and underemployment, though its economy and workforce remained diversified and there were not major reductions in military personnel. Income support payment levels were raised and no longer “temporary”. Work requirements for those receiving those benefits included volunteering in the community, and caring for children and older adults. Along with enhanced housing support and enlarged low income housing stock most families were more economically stable.

With universal health care came better family planning and reduced teen pregnancies. Neighborhoods were revitalized and strengthened through home and community co-production of food, goods and services. The crime rate went down and more child care co-ops and networks emerged across neighborhoods and communities.

There was evolution in other areas of child and family services or the factors surrounding it:

- Educational inequity across Bexar County was reduced, allowing higher educational attainment rates for low income youth, particularly women and mothers
- Pre-K was universal and the quality in all school districts rose to that of Pre-K 4 SA. Virtually all kids were ready for kindergarten.
- Some child abuse and neglect remained as did the need for foster care. Kinship care grew and payment to foster care families grew. Foster care was audited and held to a high standard. Case managers were aided by the data integration with behavioral and primary care and schools.
- Family services provided training in self-sufficiency practices and using abundance advances
- Adult abuse and neglect, domestic violence and the need for adult protective services, were reduced, but still present. They were often identified through primary care screenings and integrated community data.

#### Disability Services 4

Generally, people across San Antonio were healthier and disability rates declined. The digital divide was addressed and technological tools were universally accessible. Reductions in physical and developmental disability rates were driven by: reductions in drug use, consistent pre-natal care; better genetic screening; slowing or reversal of chronic diseases, particularly diabetes, arthritis and Alzheimer's; safer environments, and safer and healthier work places and work styles. Mental and developmental disability screening took place with pediatric and primary care exams which increased the number of people who sought and received care.

San Antonio developed more green spaces, and promoted healthier lifestyles. Some of these positive changes were outlined in the SA 2040 sustainability plan. Employers offered incentives for better, healthier lifestyles to their full-time employees and their gig workers. There was federal and local emphasis on healthy lifestyles, including prevention of disability. When individuals did require disability services there was adequate funding, mentoring, and rehabilitation to make these services a success.

Predictive and preventive measures worked in combination with remarkable medical and technological advances affecting disabilities. This included:

- Self-driving cars enhanced mobility, and public transport embraced new technologies
- 3D printing of home equipment and even smart prosthetics
- Sophisticated home monitoring and home care robots
- Friendly intelligent agents that act as helper, guide, counselor, therapist, translator, speech and hearing enhancer
- By the mid-2020s direct brain control of limbs for paraplegics, reversal of diabetes and Alzheimer's and vision and hearing restoration was available for many
- Diseases such as sickle cell disease, fragile X disease, retinitis pigmentosa, and others which are due to an abnormal gene, became treatable or preventable. There was also

progress in treating conditions caused by gene duplication, such as Down Syndrome. Many of the causes of disability, beginning in childhood, progressed towards being preventable.

Many of these are covered by universal health care (Medicare and Medicaid combined). Human service agencies provided some additional services and helped families chose among options from their health care provider and other vendors.

#### Food and Nutrition Services 4

The SA Tomorrow 2040 goal of increased local food production was achieved in the 2020s with significant home and community production of food. This ranged from conventional community gardening to high tech in-home aeroponic growing and urban agriculture using converted multistory parking garages, as well as shipping containers. 3D printed foods were widely used in the 2020s, as was cultured meat. TANF, SNAP, and Earned Income Tax were all expanded to better reflect need and cost of living, as well as the ability to buy these alternatives or buy the seeds and other factors needed for in-home and in-community growing.

Food and nutrition services adopted individualized and preventative approaches to addressing each client's food and nutritional needs. This included integration between health and human services, across public and private agencies, and greater screening within school systems. For example, if a child was identified as at-risk or nutritionally deficient, they may be directed towards local food services and their information discreetly and appropriately shared with the school system. Additionally, if a child was identified as at-risk or nutritionally deficient, their entire family was identified and ultimately assigned a case manager. There was no 'wrong door' for entering the continuum of nutritional services and other human services, both for families and individuals. Human services used a more comprehensive wellness model, addressing food, exercise, and medicine. This was supported by success in pursuing the SA2020 and SA2040 goals for healthy housing, parks, access to health care, mixed use/mixed income neighborhoods, greater equity and resilience especially for underserved areas.

#### Housing Services 4

Although San Antonio was historically not a "high cost" city for housing, costs had been growing faster than wages and this continued in the 2020s. The GBI payments helped many pay the rent, but seldom was rent less than 50% of their GBI monthly payment. The need for low income housing grew. Changing attitudes supporting equity and inclusion in the state, the recognition of housing as a fundamental need, and effective leadership enabled policy and program changes that significantly increased the low-income housing stock in the region; much of it in mixed income neighborhoods.

In San Antonio, the funding for low income housing remained largely from federal programs and there was variation of local direction across political periods and under different mayors.

SAHA had been providing housing for 27,000 families in San Antonio in 2015; 6,300 families in public housing units with federal funds for capital and maintenance costs; 13,400 families in Section 8 housing funded largely by with federal funds; and 6,800 families in subsidized non-profit or tax credit housing. Under the 2017-2021 administration, there were cuts to federal housing programs; however, tax credits for new construction remained. San Antonio developers competed vigorously for these tax credit generating projects. The State continued to promote construction of low income housing in “high opportunity” neighborhoods; at times to the neglect of place-based revitalization.

After cuts during the 2017-2021 Administration, there was a rebound in Federal funds to build and maintain public housing and for section 8 vouchers. And San Antonio took a variety of measures to increase the low-income housing stock:

- Encouraging sustainable, energy efficient, climate change resilient, low cost construction of units, both multifamily and individual new homes, and accessory dwelling units; ensuring that all of these were “healthy by design” from the start
  - In the 2020s, 6,000 new public housing units were created; all of which were in mixed income neighborhoods.
- Conservation trusts, tax credits, and non-profit owned and leased units helped maintain affordability of land and homes
- Ordinances that prohibited landlords from refusing to accept housing vouchers as rent
- Promoting the growth of accessory dwelling units, to foster mixed income neighborhoods, at first consistent with the 2015 San Antonio’s ordinance on ADU’s, but later expanding the areas where they could be developed and lessening other restrictions.
- Promote the use of abundance advances to lower the household’s cost of living
  - City and federal housing regulations and incentives encouraged landlords to equip their rental units with solar energy and storage and pass the savings to renters.

Homelessness was reduced. The remaining homeless persons and families received more personal attention and services from local agencies. There was better awareness of the services available, and how to access them. Other aspects of housing services include: aiding aging in place and combining wellness focused medical services and education with housing.

San Antonio moved towards a “housing first” model, following the example of other Texas cities to help those who require substance abuse care and other needs. This required and facilitated greater integration between housing and other human services, such as substance abuse counseling.

Emergency shelter in cases of abuse or neglect continued to be provided throughout the 2020s, though the need periodically exceeded the supply.

San Antonio homeless also benefited from Haven for Hope, a privately funded and run traditional homeless shelter that encourages personal transformation. Through the 2020s it moved thousands of homeless into more stable conditions.

Housing services were consumer focused and use predictive modeling and advanced analytics to anticipate emergency housing needs. The growing support for equity and inclusion in San Antonio and the U.S. affected how neighbors and neighborhoods felt about low and very-low income housing, and special needs housing. Many people became more accepting and welcoming of this diversity.

In addition to the housing related changes, self-driving vehicles revolutionized travel and car ownership. There was concern this could have threatened San Antonio's VIA public transport. But, consistent with the attitudes calling for equity, the VIA agency successfully integrated a fleet of self-driving vehicles into its public service, adding significant flexibility to its services and reducing isolation of some parts of the City and County.

#### Income Supports 4

Job loss to automation nationally and in San Antonio was recognized as a permanent part of the economy and workforce. Human services remained focused on job training towards good paying jobs. San Antonio companies in biosciences, aerospace, and the green economy were leaders and generated many jobs in the 2020s. Virtual training for certificates and degrees increased, allowing people to access education on their own terms.

San Antonio led the state and nation in raising the minimum wage to a living wage. This was particularly helpful to many of the 120,000 workers in the city in the hospitality sector. The increase prompted slightly faster automation of many jobs (particularly in retail sales, fast food, and some hospitality sector jobs). Also, many employers shifted their workforce from full or part time employees working at the living wage or above, to having workers on the "gig economy". This work often provided insufficient income, and need for income supports continued.

In this setting of high structural unemployment, after cuts in income support payments during the 2017-2021 administration, in the 2020s, federal income support payments were expanded and some, such as TANF, were recognized as not being "Temporary". And work requirements shifted to include volunteering, caring for children or older adults, or other contributions in the community.

Income supports were coordinated with other human service, health and education efforts. Housing vouchers, public housing, affordable low-income housing helped with housing. Health care was universal and shared data with human services and education to best assess personal and family needs. Investment in Pre-K 4 SA and upgrading Pre-K in school districts, along with more equitable quality education set kids on a better path for success in adulthood. Predictive analytics worked with and within schools for upstream intervention.

When families do require government assistance, there were adequate funds. Barriers to access- such as language- were largely addressed with technology and San Antonio's previous work to address the digital divide. The administrative work for income support and other human services was automated, allowing cost and time savings. Each family or individual was matched with a

case manager - to explain TANF, aid in matching recipients with work opportunities and to address overall wellness. These case managers were both in-person and virtual, depending on the client. Predictive analytics and tools for assessing the integrated needs for each person and family led to getting what each person most needs. Policy makers, community organizations, and community members were all more understanding of 'equity' - there was a shift from "I" to "we" and so receiving income supports was no longer stigmatized.

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## END NOTES

### <sup>i</sup> Job loss to automation

Job loss to automation and cognitive computing will have a major impact on the economy, family income, and the need for human services in the years ahead. We believe this has been happening and it will eliminate more jobs through the 2020s. As with past disruptions of this type, new jobs will be created. Some of these new jobs are identified in the sources below. And there will be teaming of AI and human workers (as precedent; in 2017, the best chess competitors are teams of humans, without grand master chess champions, and multiple computers, but not supercomputer as often used for IBM's Watson). Yet overall, the number of new jobs created is likely to be far fewer than the jobs lost.

For these Human Services and Human Progress 2035 scenarios, we have used the Forrester estimate of a net loss, by 2025, of 7% of US jobs (see first bullet below). And we assume that net job loss will accelerate in the later 2020s and 2030s. We have worked with human service experts to apply and check forecasts for specific human service jobs as well. Below are highlights of the forecasts that indicate the range from which we developed the forecasts we are using in our scenarios.

- Forrester forecasts in the report “The Future of White-Collar Work: Sharing Your Cubicle With Robots” that cognitive technologies such as robots, artificial intelligence (AI), machine learning, and automation will replace 22.7 million (or 16%) of U.S. jobs, while 13.6 million will be created — a net loss of 7% of U.S. jobs by 2025. Office and administrative support staff will be the most rapidly disrupted. Newly created jobs will include robot monitoring professionals, data scientists, automation specialists, and content curators.  
Forrester Research. (2017). *The Future Of Jobs, 2027: Working Side By Side With Robots*.  
As cited in Schiller, B. (2015, August). Robots Will Take Your Job, But First They'll Be Your Annoying Coworker. Retrieved from <https://www.fastcompany.com/3050428/robots-will-take-your-job-but-first-theyll-be-your-annoying-co-worker>
- Within five years (of 2016), robots and so-called intelligent agents will eliminate many positions in customer service, trucking and taxi services, amounting to 6 percent of jobs, according to a Forrester report. "By 2021, a disruptive tidal wave will begin," said Brian Hopkins, VP at Forrester Research. "Solutions powered by AI/cognitive technology will displace jobs, with the biggest impact felt in transportation, logistics, customer service, and consumer services."  
Taylor, H. (2016, September). AI will eliminate 6 percent of jobs in five years, says report. Retrieved from <http://www.cnn.com/2016/09/12/ai-will-eliminate-six-percent-of-jobs-in-five-years-says-report.html>
- McKinsey Global focuses on probability of tasks within occupations being automated and determined that 49% of time spent on tasks could be automated with current technologies, but only 5% of total jobs could be automated away in the report by McKinsey Global (2017). *A Future that Works: Automation, Employment, and Productivity; Harnessing Automation for a future that works*. Retrieved from <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>.
- An OECD policy brief forecasts that an average of 9% of US jobs (13 million) are at high risk for automation; these are jobs for which 70% of the tasks could be automated.  
OECD (2016). *Policy Brief on the Future of Work: Automation and Independent Work in a Digital Age*. Retrieved from <http://www.oecd.org/employment/Policy%20brief%20%20Automation%20and%20Independent%20Work%20in%20a%20Digital%20Economy.pdf>.



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- A study by the UK office of PWC analyzed the workforce in several countries. In terms of specific sectors, it found different degrees of risk for automation. The following economic sectors have varying probabilities of automation, represented as a percentage: transportation and storage (56%), manufacturing (46%) and wholesale and retail (44%), but lower in sectors like health and social work (17%). For countries overall, the jobs at high risk of automation by the early 2030s are U.S. (38%), Germany (35%), UK (30%) and Japan (21%).

PriceWaterhouseCooper. (2017). *Will robots steal our jobs? The potential impact of automation on the UK and other major economies*. PWC UK Economic Outlook. Retrieved from <https://www.pwc.co.uk/economic-services/ukeo/pwcukeo-section-4-automation-march-2017-v2.pdf>

Nelson, E. (2017, March). Why Americans have a higher risk of automation than jobs in Germany, the UK, and Japan. Retrieved from <https://qz.com/941163/pwc-study-automation-risk-is-higher-for-american-jobs-than-for-workers-in-germany-the-uk-and-japan/>
  - One of the most cited studies is from Oxford University researchers Frey and Osborne. They project about 47% of total U.S. employment is at risk for automation by 2030.

Frey, C., & Osborne, M. (2017). The future of employment: How susceptible are jobs to computerization?. *Technological Forecasting and Social Change*, 114, 254-280. Available at [http://www.oxfordmartin.ox.ac.uk/downloads/academic/The\\_Future\\_of\\_Employment.pdf](http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf)
  - The Bain & Company 2018 report “Labor 2030: The Collision of Demographics, Automation and Inequality” states that “In the US, a new wave of investment in automation could stimulate as much as \$8 trillion in incremental investments and abruptly lift interest rates. By the end of the 2020s, automation may eliminate 20% to 25% of current jobs, hitting middle- to low-income workers the hardest. The study estimates an average annual displacement of 2.5 million workers from 2020 onward over the next 10 to 20 years.

Bain & Company. (2018). *Labor 2030: The Collision of Demographics, Automation and Inequality*. Bain. Retrieved from <http://www.bain.com/publications/articles/labor-2030-the-collision-of-demographics-automation-and-inequality.aspx>.
  - In developing countries job loss could be higher. Harnessing new World Bank data that builds on Frey and Osborne’s original methodology, the authors consider the risks of job automation to developing countries, estimated to range from 55% in Uzbekistan to 85% in Ethiopia, with a substantial share of jobs being at high risk of automation in major emerging economies including China and India (77% and 69% respectively).

While manufacturing productivity has traditionally enabled developing countries to close the gap with richer countries, automation is likely to impact negatively on their ability to do this, and new growth models will be required.

The impact of automation may be more disruptive for developing countries, due to lower levels of consumer demand and limited social safety nets. With automation and developments in 3D printing likely to drive companies to move manufacturing closer to home, developing countries risk ‘premature de-industrialisation’.

Even within countries, the impact of automation will not be a ‘one size fits all’ issue, leading to the divergence of the fortunes of different cities. While a number of cities may have been affected by, for example, offshoring of manufacturing in the past, the expanding scope of automation now means that even low-end service jobs are at risk, making a different set of cities vulnerable.

[Technology at Work v2.0: The Future Is Not What It Used to Be](https://www.oxfordmartin.ox.ac.uk/publications/view/2092). Retrieved from: <https://www.oxfordmartin.ox.ac.uk/publications/view/2092>

## New Jobs Created

While there will be a net loss of positions, technology will create new jobs.

- The number and types of jobs projected span a wide range. Forrester forecasts that by 2027, there will 14.9 million jobs created (although there will be a loss of 24.7 million jobs in the same period). New jobs will be created in software, engineering, design, maintenance, support, training, and other specific areas.

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Forrester Research. (2017). Forrester Predicts Automation Will Displace 24.7 Million Jobs and Add 14.9 Million Jobs by 2027. Retrieved from <https://www.forrester.com/Forrester+Predicts+Automation+Will+Displace+247+Million+Jobs+And+Add+149+Million+Jobs+By+2027/-/E-PRE9745>; Cited in Passy, J. (2017). This is how many U.S. jobs robots will create over the next 10 years. Retrieved from <https://www.marketwatch.com/story/this-is-how-many-us-jobs-robots-and-automation-will-create-over-the-next-10-years-2017-04-04>

- Types of jobs created include robot monitoring professionals, data scientists, automation specialists, and content curators. Many new jobs will be in the fields of software, engineering, design, maintenance, support and training. Other future jobs include avatar designers, synthetic acting casting agents, roboticists, fluid interface engineers and programmable surface designers.
- There are several main AI technologies that advancing and may change business and business operations<sup>1</sup>. These include: natural language generation, speech recognition, virtual agents, machine learning platforms, AI optimized hardware, deep learning platforms, semantic technology, biometrics, image and video analysis, and robotic process automation. These technologies may replace positions or they may supplement tasks within positions.  
Press, G. (2017 January). Top 10 Hot Artificial Intelligence (AI) Technologies. Retrieved from <https://www.forbes.com/sites/gilpress/2017/01/23/top-10-hot-artificial-intelligence-ai-technologies/#3118410d1928>
- There are many projections about the future of work evolving through robots and humans working together across various sectors. For example, established and traditional jobs may need additional skills to monitor the interactions between humans and robots, such as newly specialized lawyers and new human resources positions to guide staff as robots enter the workplace.
- It is projected that by 2020, 20% of businesses will have workers that monitor and guide neural networks. Gartner. (2017). The Disruptive Power of Artificial Intelligence. Retrieved from <https://www.gartner.com/smarterwithgartner/the-disruptive-power-of-artificial-intelligence/>
- The CEO of IBM asserts that ultimately AI will create jobs- including programmers, developers, and jobs that manage the relationship between AI and humans.  
Business Insider Intelligence. (2017). IBM CEO says AI and automation will create jobs. Retrieved from <http://www.businessinsider.com/ibm-ceo-says-ai-and-automation-will-create-jobs-2017-1>

## ii Human services job loss to automation

Some task automation was applied across human service worker categories:

- Most levels of human service workers had their work on eligibility dramatically reduced by automation of information gathering and eligibility determination.
- Language translation, reflecting cultural, religious, and personal sensitivities of the person/client is instantly available for any language between 2020 and 2025.

Specific human service job categories during the 2020s saw job loss to automation, expert systems, and cross agency collaboration:

- 80% reduction of secretaries, administrative assistants, receptionists and information clerks -
- 50% reduction of accountants and auditors
- 10% reduction of personal and home care aides (Many of the physical tasks required by personal and home care aides, such as lifting and cleaning patients, are more difficult and costly to automate)
- 10% reduction of social workers – (though many tasks automated or accelerated: Home risk assessment - periodic physical inspection is needed but intermittent inspection can be done by smart phone and from

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data from smart home systems; Generation of case records and reports is expedited or automated fully; Some assessments of children or family conditions can be done by interviews by intelligent agents that generate recommendations or prescriptions that are ultimately approved by the social worker or physician/licensed prescriber; Virtual reality and holographic advances allow social workers to interview, interact, counsel without traveling once rapport is established; Assessment of physical abuse on the skin can be done by deep learning algorithms review of smart phone images of skin bruises; Genetic and epigenetic testing is done routinely on children. Repeated genetic testing allows identification of some types epigenetic changes caused by adverse childhood events.

- 50% reduction of human service assistants – (through automation of secretarial and administrative tasks; use of self-driving cars supply much of the transportation needs).

### iii Developing low and very-low income housing options

Housing remains a major human need. Housing insecurity brings a series of other needs. Communities around the country are and will use a variety of approaches to increase the stock of low and very low income housing, including:

- Allowing a higher number of unrelated individuals to live in the same house;
- Facilitate accessory dwelling unit development, and require maintaining the units as low income for several years;
- Fostering neighborhood parking and driving regulations to dampen traffic from increased residents;
- Taxing unoccupied homes;
  - Prohibiting or taxing AirBnb and related uses of rental properties or taxing that use to provide a fund to make other properties available; Restrict rentals in accessory dwelling units and other low income housing to a minimum of 30 or 60 days
- In addition to federally funded vouchers create state or locally funded vouchers;
  - This serves to help alleviate concentrations of poverty by giving voucher holders more options of where to live.
- Tax construction profits to add to the funds for low income housing development;
- When low cost solar and other sustainable energy production and storage becomes available, require or incentivize landlords to install this and pass the savings on to renters;
  - Or enable, through loans from utilities or others, installation of this equipment; paying the loans off with the energy savings.
- Adjust regulation to support fast construction of safe, sustainable and energy efficient new developments that include very low income housing;
- Support and encourage alternative construction, including 3D printing of housing components and repurposed materials, using modular and “tiny homes”;
- Use various combinations of these approaches to deconcentrate poverty.

### iv The Guaranteed Basic Income

The guaranteed basic income, also called the Guaranteed Annual Income, the Negative Income Tax, the Citizen’s Income, and the Basic Income Guarantee has been proposed by conservatives and liberals in the U.S. for decades. Richard Nixon proposed the Negative Income Tax. Conservative Charles Murray supports basic income to help keep the United States competitive during labor market transformation to robotics and replace the current welfare program (see Murray, “A Guaranteed Income For Every American,” <https://www.wsj.com/articles/a-guaranteed-income-for-every-american-1464969586>).

Support by liberals and conservatives offering different rationales. For example, some conservatives favor reduced government spending, eliminating duplicative programs and staff, through an effective way to reduce poverty (see

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The Atlantic, “The Conservative Case for a Guaranteed Basic Income”

<https://www.theatlantic.com/politics/archive/2014/08/why-arent-reformicons-pushing-a-guaranteed-basic-income/375600/>).

Basic income experiments have taken place across the world. In Canada and Namibia, both of their GBI experiments saw a reduction in poverty and other positive impacts such as increased graduation rates and decreased hospitalizations and teenage pregnancies. The Canadian province Manitoba piloted basic, minimum income-referred to as “mincome”- in the mid-1970s. Although the program was removed after a few years, it yielded positive results including higher rates of remaining in school, lower rates of hospitalization, and hardly a change in work rates (see Surowiecki, James. "Money For All". *The New Yorker*. N.p., 2016. Web. 7 July 2016). The amount of money recipients received was determined by need (see Lum, Zi-Ann. "A Canadian City Once Eliminated Poverty And Nearly Everyone Forgot". *The Huffington Post*. N.p., 2016)

Finland is currently piloting a basic income, which aims to cut red tape and reduce poverty and unemployment. (See, The Guardian, “Finland trials basic income for Unemployed,”

<https://www.theguardian.com/world/2017/jan/03/finland-trials-basic-income-for-unemployed>.)

There has been growing support in recent years as the forecasts for job loss to automation have grown. The projections for total job loss by roughly 2030 in the United States range from: 47% (Frey and Osborne), 38% (Price Waterhouse Cooper), to 9% (OECD).

While there are a range of levels that the GBI has been proposed e.g. \$10,000 income plus 3,000 for health insurance, up to \$32,000 yearly in Switzerland; the level in this forecast \$12,000 yearly for adult citizens and \$4,000 per child is proposed by Andrew Stern (see Stern, Andy and Lee Kravitz. *Raising The Floor: How A Universal Basic Income Can Renew Our Economy And Rebuild The American Dream*. 1st ed. New York: Public Affairs, 2016. Print.)

Hawaii has become the first state to pass a bill in the houses of State Legislature towards a universal basic income (UBI) bill HRC89. Hawaii has experienced job declines in their agricultural sector and service jobs being automated. The bill sets up a working group to explore options for the state UBI, involving members from State House and Senate, director of human services, Chamber of Commerce and University of Hawaii’s Economic Research Organization. This group will develop policy recommendations. (See, Vox, “Hawaii is considering creating a universal basic income”, <https://www.vox.com/policy-and-politics/2017/6/15/15806870/hawaii-universal-basic-income> and Business Insider, “Hawaii just became the first U.S. state to pass a bill supporting basic income” <http://www.businessinsider.com/hawaii-basic-income-bill-2017-6>).

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The costs of a GBI would be roughly 3 trillion yearly. Stern provides a “menu” to fund GBI (an income of \$12,000 for every adult, which would cost between \$1.75-\$2.5 trillion in federal funds each year. Add another \$296 billion when including \$4,000 for all those under 18)

- Ending all or many of the current 126 welfare programs<sup>iv</sup>, which cost \$700 billion in government and \$300 billion state government
  - Eliminating food stamps (save \$76 billion), housing assistance (\$49 billion), and EITC (\$82 billion)
- Adjusting long term retirement policy for future generations, but not changing Social Security for those who have already been contributing to the system
- Creating a new and more cost effect non-employer based healthcare system
- Some redirection of government spending and taxation

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- Raise revenue by eliminating all or some of the federal governments \$1.2 trillion in tax expenditures; do away with reductions such as investment expenses, preferential treatment of capital gains, foreign taxes, charitable contributions, mortgage interest, and accelerated depreciation.
  - Increased revenue from new sources and new technologies
    - Consider a value added tax (VAT) of 5 to 10% on the consumption of goods and services, with all revenue funding basic income
  - Implement a Financial Transaction Tax (FTT) (also known as the “Robin Hood Tax” and “Tobin Tax”) a tax on financial transactions, such as a federal tax on stock sales and financial transactions
  - Wealth tax, a levy on the total value of personal assets, including housing and real estate, cash, bank deposits, money funds, stocks, etc.
  - Look at trimming expenditure on the federal budget, such as reducing military budget (current \$600 million), farm subsidies (\$20 billion), or subsidies to oil and gas companies (\$30+ billion)
  - Carbon Tax, which at a rate of \$15/ton of CO2 would bring \$80 billion in annual revenue, or about \$250 per U.S. resident
  - A “common goods tax” such as the one placed on oil to fund the Alaska Permanent Fund
  - A reduction of tax havens
  - Jerome Glenn shared an additional two sources for funding basic income:
  - Robot licenses and taxes
  - Universal minimum corporate tax.

Some advocates of supporting low-income populations criticize GBI/UBI as being too costly, and suggest enhancing existing approaches:

Bob Greenstein of the Center for Budget and Policy Priorities argues that: "The record of recent decades (in raising people out of poverty) ... points to an alternative course — pushing for steady incremental gains through available mechanisms, including means-tested programs, to provide as much of a floor as possible for Americans of lesser means. In 1967, the safety net lifted out of poverty only 4 percent of Americans who would otherwise be poor. Today, it lifts 42 percent of such people out of poverty, with programs like SNAP and the EITC playing crucial roles alongside Social Security. A multi-pronged strategy — working to start phasing in the Child Tax Credit with the first dollar of a parent’s earnings, substantially raising the minimum wage, extending affordable child care and rental assistance to many more families, enlarging SNAP benefits (as a Hamilton Project paper proposes), and strengthening Social Security benefits for low-income workers — would substantially strengthen the income floors." See: Bob Greenstein, “Commentary: Universal Basic Income May Sound Attractive But, if It Occurred, Would Likelier Increase Poverty Than Reduce It”, *Center on Budget and Policy Priorities*, September 18, 2017, <https://www.cbpp.org/poverty-and-opportunity/commentary-universal-basic-income-may-sound-attractive-but-if-it-occurred>.

Former Clinton Treasury Secretary Robert Rubin argues for enhanced federal jobs or job training programs rather than a GBI. There are high-needs areas across the state and people should be engaged in needed work such as caring for the elderly, and paid a living wage. In a NY Times article, Rubin explains “public employment should be viewed not as a social program but as a public investment with a high rate of return.” He argues that basic income does not fulfill the desire people have to be productive members of workforce, in addition to being too costly. See: Rubin, R. (2017, November 8). Why the U.S. Needs a Federal Jobs Program, Not Payouts. *The New York Times*. Retrieved from <https://www.nytimes.com/2017/11/08/opinion/federal-jobs-program-payouts.html>.

And in California advocates argue that using the means-tested, targeted expansion of the Cal EITC would be more effective, more affordable, and more likely to be achieved. EITC has the information to determine eligibility from tax forms, and expansion would be less costly than administering a new program. Additionally, “providing income through a state tax credit would prevent the payment from being reduced by federal income tax”. See: California Budget and Policy Center, *California Already Has a Basic Income Policy – It’s Called the EITC and It Should Be Expanded*, November 1 2017. <http://calbudgetcenter.org/blog/california-already-basic-income-policy-called-eitc-expanded/>.



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## v Abundance Advances end note

Technological advancements that could become widely used in the 2020s could lower the cost of living and can support equity and sustainability along with increasing self-sufficiency and helping families and communities meet some of their basic needs. These include technologies for low cost energy and storage, food production, and 3D printing of home goods, electronics, and even homes. We label ‘abundance advances’.

### Energy Abundance

A variety of advances in energy production and storage are likely to lower the cost of this basic item. This includes solar, hydrogen, nuclear and even fusion energy. An important aspect of low cost energy is the potential to transform lives of low-income communities.

### Low Cost Solar Energy

Low cost solar energy production and storage is likely in the 2020s. New solar cell technologies for low cost production include nanotennas, keovskite and perovskite materials that will likely provide highly effective solar cells.

Perovskite cells are an efficient photovoltaic technology that have the potential to be produced at low cost.

Hybrid perovskite cells may double the efficiency of solar cells, and ultimately lower cost.

Purdue University. (2017). Crystalline material could replace silicon to double efficiency of solar cells. Retrieved from <https://www.purdue.edu/newsroom/releases/2017/Q2/crystalline-material-could-replace-silicon-to-double-efficiency-of-solar-cells.html>

Perovskite cells for solar energy are being created at the fastest pace in solar energy history. As reported in Solar Magazine, the cells must achieve increased durability and scalability of production to be a widespread use but do hold great potential.

Burger, A. (2018). Industrial Chimera or Evolutionary Leap: Perovskite Solar Cells and Cheap, Ubiquitous Solar Energy. *Solar Magazine*. Retrieved from <https://solarmagazine.com/perovskite-solar-cells-commercialization/>

See also: National Renewable Energy Laboratory. (2018). Perovskite Solar Cells. Retrieved from <https://www.nrel.gov/pv/perovskite-solar-cells.html>

Other advances include a solar cell designed to be full spectrum with the ability to capture nearly all of the solar spectrum.

George Washington University. Scientists design solar cell that captures nearly all energy of solar spectrum. (2017). *Tech Xplore*. Retrieved from <https://techxplore.com/news/2017-07-scientists-solar-cell-captures-energy.html>

Installation and Storage costs for solar are decreasing and are projected to continue to become less expensive.

Solar and energy storage costs have been declining and are likely to continue to fall. “These declines reflect innovation and benefits from mass production and are welcome signs on the road to greater adoption of renewable energy for electricity” according to J.P. Morgan Chase & Co. (2017). Annual Energy Paper. Retrieved from <https://www.jpmorgan.com/jpmpdf/1320736484665.pdf>

As solar energy advances, costs will drop. As reported by the Solar Energy Industry Association (SEIA), from 2010-2017, the cost to install solar energy declined by 70% while solar grew in terms of installation and share of energy capacity across the United States. Labor costs, permitting and installation fees and supply chain costs related to solar likewise declined. SEIA. (2018). Solar Industry Research Data: Solar Industry Growing at a Record Pace. Retrieved from <https://www.seia.org/solar-industry-research-data>

As projected by Green Tech Media, prices of solar are projected to continue to decline at the rate of 4.4% for a 27% reduction by 2022. Wesoff, E., & Lacey, S. (2017). Solar Costs are Hitting Jaw-Dropping Lows in Every Region of the World. Retrieved from <https://www.greentechmedia.com/articles/read/solar-costs-are-hitting-jaw-dropping-lows-in-every-region-of-the-world>

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Storage prices are dropping much faster than anyone expected, due to the growing market for consumer electronics and demand for electric vehicles (EVs). Major players in Asia, Europe, and the United States are all scaling up lithium-ion manufacturing to serve EV and other power applications. No surprise, then, that battery pack costs are down to less than \$230 per kilowatt-hour in 2016, compared with almost \$1,000 per kilowatt-hour in 2010. McKinsey research has found that storage is already economical for many commercial customers to reduce their peak consumption levels. At today's lower prices, storage is starting to play a broader role in energy markets, moving from niche uses such as grid balancing to broader ones such as replacing conventional power generators for reliability, providing power-quality services, and supporting renewables integration. David Frankel and Amy Wagner, Battery storage: The next disruptive technology in the power sector, McKinsey & Company. Retrieved from: <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/battery-storage-the-next-disruptive-technology-in-the-power-sector>

### **Fuel Cell, Nuclear, and Other Energy Forms**

Other forms of sustainable energy may develop, such as small scale fusion and fuel cells that produces low cost energy may become available.

Nuclear fusion power has the potential to produce nearly four times the energy as nuclear fission with very low carbon emission and could provide accessible, clean energy. Tokamak Energy's ST40, was successful in 2017 in achieving first steps toward fusion energy. Developers hope to have a successful power generator by 2025 and be delivering fusion energy to the grid (in the UK) by 2030.

Lant, K. (2017, May 18). Mini Reactors Could Make Affordable Fusion Power a Reality by 2030. Retrieved from <https://futurism.com/mini-reactors-could-make-affordable-fusion-power-a-reality-by-2030/>.

Small scale fusion, a low-cost form of energy production in which atomic nuclei release energy, capable of powering a small town using a unit the size of a flatbed truck. See 21<sup>st</sup> Century Tech. (2016). Fusion Reactors Two Steps Closer to Reality. Retrieved from <http://www.21stcentech.com/fusion-reactor-step-closer-reality>

Small scale nuclear (fission) power stations are being proposed and in 2018 one developer argued they would be online in 8 years – by 2026. The company, NuScale, is aiming for commercial operations in 2026 for a plant in Utah comprised of a dozen 50-megawatt reactors. Retrieved from Polson, J. (2018, April 10). First Small-Scale Nuclear Reactor May Be Just Eight Years Away. Available at <https://www.bloomberg.com/news/articles/2018-04-10/first-small-scale-nuclear-reactor-may-be-just-eight-years-away>

Hydrogen fuel cells have been proposed as a clean source of energy. Though it has been costly to develop the feedstock for hydrogen, recent research published in the Journal of Catalyst has found that ammonia can be used to stimulate hydrogen fuel. Cited in Robitzki, D. (2018, April 30). Cheap Hydrogen Fuel Was a Failed Promise – But its Time May Have Arrived. Retrieved from <https://futurism.com/ammonia-hydrogen-fuel>

According to an article published on Energy Central, fuel cell technology will change daily lives in five ways. These are: cleaner vehicles with less or no carbon emission, more reliable power for homes and buildings, enhancing mobile phone charge and design, incorporation into fossil fuel design to bridge the gap with renewables, and freedom from the grid towards independent and individual energy production. Hughes, J. (2016, February 15). Top 5 Ways That Fuel Cells Will Impact the Way We Live in the Future. Retrieved from <https://www.energycentral.com/c/iu/top-5-ways-fuel-cells-will-impact-way-we-live-future>

### **3D Printing**

3D printing for distributing and manufacturing of goods may disrupt global supply chains and allow local and customized production of goods, often using sustainable and upcycled materials. 3D printing has the potential to impact the lives of low income communities, including through 3D printing of home goods and even whole homes, transportation aids and vehicles, and prosthetics. Communities can become empowered through low cost 3D printing, and as 3D printers become more affordable they can be shared and accessed in libraries, community centers or the equivalent of Kinkos stores. Housing for low income can also be transformed by 3D printing.

3D printing can help alleviate poverty in several ways argues Ashley Morefield in Borgen Magazine. 3D printing can lower the cost weather stations from \$10,000 to \$200, enabling communities in developing countries to get weather stations and better anticipate severe weather; a company called Liquidity Nanotech uses electrospinning 3D printing to create water filters that remove impurities and block microbes; the Victoria Hand Project uses 3D printers to create upper-limb prosthetics and works with health care providers to make these available in developing



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countries; a Chinese company called WinSun Decoration Design Engineering constructed 10 single story homes in 24 hours at a cost of \$5,000 each; transport vehicles, starting with mountain bikes have been 3D printed. A Harvard Business Review argued that “with five years (of 2015), one can expect to see fully automated, large-quantity manufacturing systems that are extremely economical”

Morefield, A. (2016, October 14). Borgen Magazine, Five Ways 3D Printing Can Help Alleviate Poverty. Retrieved from <http://www.borgenmagazine.com/3d-printing-alleviate-poverty/>

3D printing of homes and multiunit buildings has already begun. For example, San Francisco based company Apis Cor built an entire small 400 square foot home through 3D printing in 24 hours. However, workers completed touches such as painting and some manual installation.

Moon, M. (2017). A San Francisco startup 3D printed a whole house in 24 hours. Retrieved from <https://www.engadget.com/2017/03/07/apis-cor-3d-printed-house>

3D printed homes are also being manufactured at an economical price. Texas based company ICON in cooperation with New Story created a 650-square foot 3D printed home that costs \$10,000; took 24 hours to complete; and meets the building codes of the City of Austin where it was built. New Story intends to build these in developing countries for a cost of \$4,000.

Resinger, D. (2018, March 12). *This Company will 3D Print a House for \$10,000*. Retrieved from <http://fortune.com/2018/03/12/sxsw-2018-3d-print-home-icon/>

## **Food Abundance**

Food insecurity and inability to access healthy foods are common problems for many low-income communities across the nation. This may be challenged further with environmental and economic changes; however, there are technologies that may empower communities to increase self and shared sufficiency and produce nutritious, affordable food.

While conventional agriculture is being challenged by climate change – particularly drought, higher temperatures – but also floods and fires, in-community and in-home food production is growing, both conventional gardening and more high-tech forms such as hydroponics and aeroponics. In addition, 3D printing and cultured meat could change food patterns.

Advances in food production include aeroponics and hydroponics (growing plants in an air, mist or water environment) to produce nutritious food in large amounts quickly and sustainably. This can be done in urban environments using vertical farms and other techniques. Vertical farming, which grows food usually with hydroponic or aeroponics methods in stacked layers, offers a more sustainable year-round crop production with high yields and climate resiliency. There are employment opportunities including with engineers and workers in maintenance. Then, as automation increases, new jobs will include system analysis and software development positions.

Benke, K. & Tomkins, B. (2017). Future food production systems: vertical farming and controlled-environment agriculture. *Sustainability: Science, Practice and Policy*, 13, 13-26.

David Rosenburg, CEO of AeroFarms (see more: <http://aerofarms.com/>) is quoted as explaining vertical farming can grow produce in around half the length of time observed in a field, using 95% less water, around 50% less fertilizer, and no herbicides, fungicides, pesticides.

Brennan, M. & Gralnick, J. (2015). Vertical farming: The Next Big Thing for Food- and Tech. Retrieved from <https://www.cnn.com/2015/06/24/vertical-farming-the-next-big-thing-for-food-and-tech.html>

Another area of food abundance is cultured meat, which is progressing in taste and affordability and may become a major sustainable and accessible source of producing protein.

When lab grown burgers first emerged, they were extremely expensive – and not particularly tasty. In 2013, Mosa Meat produced a cell-cultured beef burger which took months to produce and would have cost \$1.2 million per pound to sell. But, in four years, the price has fallen dramatically. In four years, the price of lab-grown “meat” has fallen by 99% and there’s still a long way to go.

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Purdy, C. (2017, June 5). There's still a long way to go. Retrieved from <https://qz.com/997565/in-four-years-the-price-of-lab-grown-meat-has-fallen-by-96-theres-still-a-long-way-to-go/>

Mosa Meat can currently produce meat that costs \$27 to \$45 per pound, and they will enter the market with a premium priced product in five years (thus, around 2021) and that in another five years (around 2026) the prices will be competitive to what people currently pay for beef. The lower competitive price, combined with a convincingly real taste and sensation, and environmental and animal rights motivations, may allow for widespread production and consumption of cultured meat.

Burningham, G. (2016, February 28). Lab-Grown Beef Will Save the Planet- And Be a Billion Dollar Industry. Retrieved from <http://www.newsweek.com/2016/03/11/lab-grown-beef-will-save-planet-and-be-billion-dollar-business-430980.html>

Several other companies, including Impossible Foods (see more: <https://www.impossiblefoods.com/>), are producing fully plant-based meats and cheeses. In 2017 the chain Clover Food Lab began selling Impossible Food's meatballs in a sandwich or platter in its stores. Retrieved from <https://www.cloverfoodlab.com/locations/location/?l=cloverhsq>

In 2017 the Futurist Thomas Frey in a review of the emerging sector and the companies involved, forecast that "by 2025 industrial grown meats will become the world's cheapest food stocks". The Coming Meat Wars (2017). Retrieved from <https://www.futuristspeaker.com/job-opportunities/the-coming-meat-wars-17-mind-blowing-predictions/>

Some advocates of cultured meat argue for it as a way to get beyond animal agriculture and its harmful impacts on the environment – contributing to as much as 19% of greenhouse gases. And some are calling it the "clean meat" industry.

The cattle and beef industry is objecting to the terms cultured meat or clean meat and pressing for regulation to prevent the use of the term "meat". The succeeded in having the state of Missouri where a bill passed with bipartisan support that says that only products that are derived from harvested production livestock or poultry (which died by slaughter) can be called meat. From Haridy, R. (2018, May 20). Lab-grown meat not meat according to state of Missouri. New Atlas. Retrieved from <https://newatlas.com/lab-grown-meat-classification-bill-missouri/54687/>

There will be issues of nutrients, micronutrients, and other issues to be dealt with, but if Thomas Frey's forecast above is correct, cultured meat could be a major food by the late 2020s.

## More Abundance

For a more extensive look of abundance, some entrepreneurs project that technology will advance incredibly rapidly in the upcoming two decades and enable the basic needs of water, food, energy, health and education to be met for every person on the planet. Peter Diamandis published his book in 2012: See: Diamandis, P., & Kotler, S. (2012). *Abundance: The Future is Better Than You Think*. New York: Free Press. And has an ongoing monitoring of developments that he and his colleagues report in their weekly "Abundance Insider" blog. <https://www.diamandis.com/blog/topic/abundance-insider>

And nanotechnology expert K. Eric Drexler, argues that in the 2030s the full flowering of nanotechnology will allow us to do nano-manufacturing of most of our needs at relatively low costs – hence the title of his book: *Radical Abundance*. For example:

- Molecular biology and chemistry will enable many of the items we use daily to be built with atomic precision.
- Transportation, construction, manufacturing, water and food production will become easier to do and so more accessible and beneficial to more people globally.

See: Drexler, K. Eric. (2013). *Radical abundance*. New York: PublicAffairs.