COMPREHENSIVE SOLD WASTE MANAGEMENT STRATEGY

VISION FOR DENTON THINK-TANK REPORT

Denton, Texas

May 2021

COMPREHENSIVE SOLID WASTE MANAGEMENT STRATEGY

VISION FOR DENTON THINK-TANK REPORT

DENTON, TEXAS

MAY 2021

This visioning report has been produced as part of Denton's Comprehensive Solid Waste Management Strategy Project and represents a summary of Task 1.

Report Prepared by:

future→iQ®

Create **Future Intelligence**®

BURNS McDONNELL

Think-Tank Hosted by:

CITY OF DENTON

TABLE OF CONTENTS

1.0 INTRODUCTION

Task 1 of Denton's Solid Waste Management Strategy Project has allowed community stakeholders to take a 'deep-dive' into strategic visioning and future-thinking through a scenario-planning process.

This report represents the culmination and summary of Task 1 of the seven-task Denton Solid Waste Management Strategy project. The overall project aims to produce an executable strategy, which will guide Denton's solid waste and recycling priorities for the next twenty years. Task 1 was designed to gather significant and relevant data, leading to the discovery of expected and preferred futures for the future of solid waste management and recycling in Denton. Each step of Task 1 built upon the preceding steps. The project kicked-off on November 16, 2020, with Task 1 wrapping-up on May 27, 2021.

The following provides descriptions of each deliverable completed in Task One:

- **Virtual Project Launch** – Burns & McDonnell and Future IQ collaborated to provide an online overview of the scope and timeline of the project.
- **Denton Solid Waste Management Community Survey** – A collaboratively developed survey was distributed as broadly as possible in the community. The survey was made available via an online project portal and was live from January 25 through March 1, 2021. 883 individuals participated in the survey.
- **Think-Tank Module 1: Future Trends** – This two-hour module provided participants with an overview of macro and local trends impacting solid waste management. Trends were examined with an eye to current processes, as well as the impact of these trends looking out to 2040. This workshop took place virtually on Thursday, April 8, 2021.
- **Think-Tank Module 2: Key Drivers** – This two-hour module explored key drivers of solid waste management and recycling and introduced participants to the main themes used to create the scenario matrix for Module 3 of the Think-Tank. The Key Driver Workshop took place on Thursday, April 15, 2021.
- **Think-Tank Module 3: Think-Tank** – The two-hour scenario-based planning Think-Tank module on April 29, 2021, provided an important opportunity to engage community stakeholders and city staff in a critical dialogue about the future and to discuss the impacts of changing dynamics solid waste management and recycling looking out to 2040.
- **Denton Solid Waste Management Vision Survey** – Participants of the Think-Tank modules were asked to participate in the Vision Survey. Results produced heatmaps that illustrate expected and preferred futures for solid waste management in Denton looking out to 2040.
- **Future Summit** – This one-hour summit provided community stakeholders with a summary of survey and Think-Tank findings in the project's Think-Tank report and allowed for questions and answers. The Future Summit was held on May 27, 2021.

2.0 FORCES SHAPING THE FUTURE

In the face of accelerating speed of change, the key to resiliency is the ability to anticipate change and remain agile. To be successful, Denton's new comprehensive solid waste management strategy will require the active involvement of all community stakeholders.

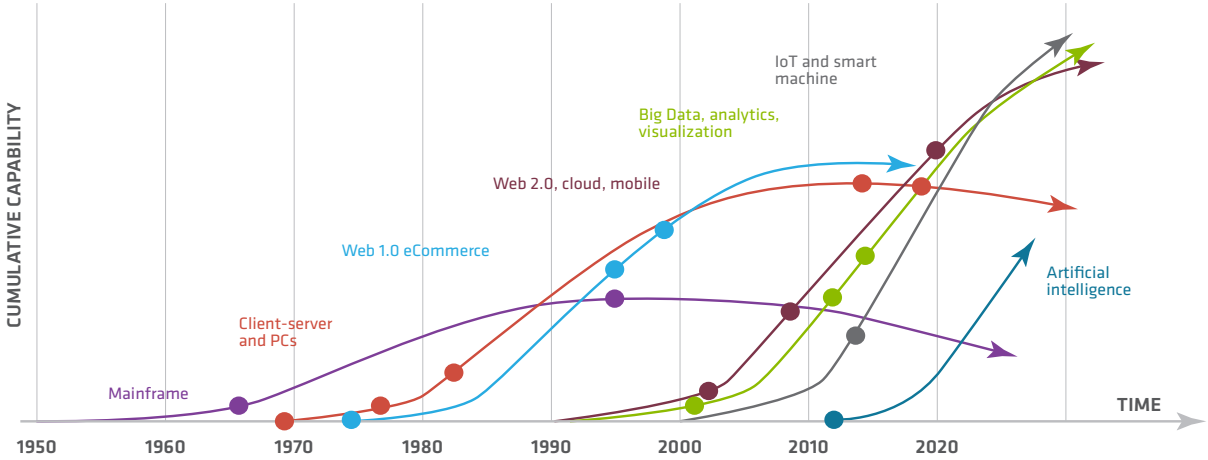
The three Think-Tank modules provided a forum for participants to explore the forces of change shaping the future of solid waste management and recycling in the City of Denton. Participants at the Think-Tank modules explored emerging macro trends, key drivers, and possible future scenarios. Perceptions around the nature of impact of these forces, both in terms of size and timing of impact, were explored to gauge how important participants consider these forces of change. Participants discussed the emerging trends on global, regional, and local scales, and related them directly to solid waste management and recycling in terms of how well prepared they considered the City of Denton.

Specifically, the trend areas were:

- Consumption patterns and waste types
- Policy setting and application of technology
- Waste management systems being utilized

Of relevance to the discussion on trends, is the speed and scale of change that is occurring. Newly developed innovations in solid waste management are being implemented globally and locally at all scales, thereby changing the face of industries and society in a rapid and profound way. Advanced technologies are at the forefront of this transformation. At the same time, societal values are shifting, and there is an increased awareness of environmental factors and sustainable resource use.

The Increasing Capability of Digital Technologies



Digital Transformation Initiative Mining and Metals Industry, White Paper, World Economic Forum / Accenture analysis, January 2017

"Denton has the chance to set a great example for the rest of the area and State. Denton is on the progressive side and we could make a huge dent in the general mentality regarding Waste Management in this state."

- Denton Community Survey Respondent

3.0 SURVEY RESULTS – KEY STAKEHOLDER INPUT

Prior to the Think-Tank modules, a community survey was conducted, and 883 community stakeholders responded to the survey. Respondents were asked about their views on having a shared vision for the future of solid waste management and recycling in Denton. Below are the compiled results of the community survey.

The community survey has achieved a strong response rate from private residents. This suggests the survey reflects the desires of the broader community.

3.1 PROFILE INFORMATION

In terms of survey respondent demographics, most respondents were aged 40 or over, with 33% between the ages of 18-39. Respondents were asked about their organizational affiliation.

Survey respondent self-identified organizational affiliation

"I appreciate Denton's environmentally progressive thinking and programs available through solid waste and other city departments. I encourage you to keep up the good work; it's so important right now to do these things to combat climate change and keep our environment clean."

- Denton Community Survey Respondent

DataInsight

DATA INSIGHTS:

- Survey respondents overwhelmingly self-identified as private residents.
- Survey respondents were well distributed across the age ranges from 18 years to 80 years of age; with most age-decade groups (i.e., 30-39 years old) having 15-20% of responses. Survey responses were dominated by women, with nearly 60% of response self- identifying as female.
- In addition, respondents reported a wide range of periods of living in Denton, with good sized cohorts from 0-5 years, right through to 41 years or more.

3.2 IMPORTANCE OF A SHARED VISION

A long-term vision for solid waste management was identified as important not only for Denton, but also for survey respondents' decision making at a level of their home, business, or organization.

Survey respondents were asked two questions about the importance of having a shared vision for the future of solid waste management in Denton. The questions were:

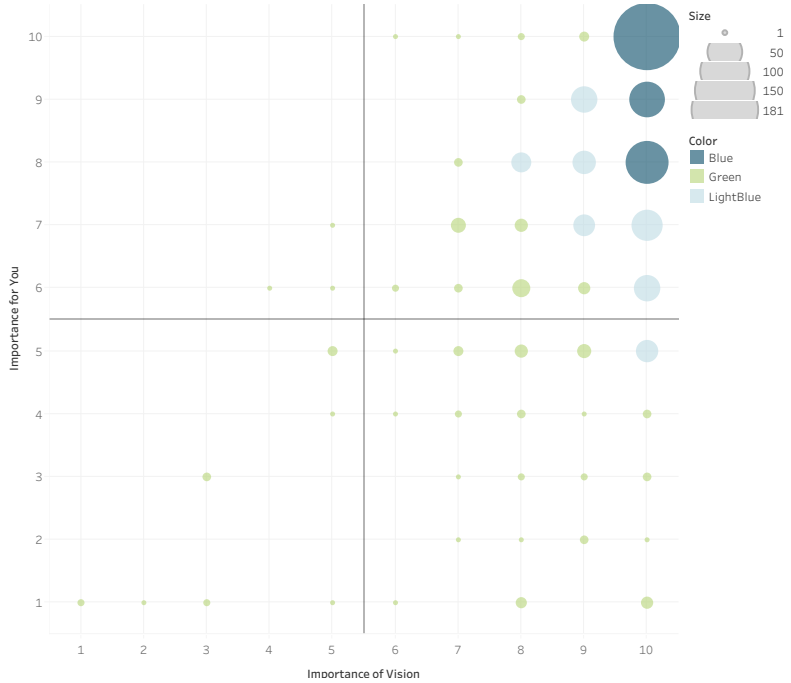
- How important it is to have a long-term vision for solid waste management in the city?
- How important is long-term vision for making decisions in your home, business, or organization?

The scale was: 1 = Not at all important; 10 = Critically important

Below is an illustration of the combined responses in a pivot chart (n=625). This chart seeks to understand the importance of vision, and how much having a city vision will influence individual choices and decision making.

Importance of Vision

Pivot Chart - Importance of VISION X Importance for YOU - All Data
X axis is Importance of VISION - Scale: 1= Not at all important; 10 = critically important.
Y axis is Importance for YOU - Scale: 1= Not at all important; 10 = critically important.



DataInsight

DATA INSIGHTS:

- Most survey responses are in the extreme upper right quadrant of the matrix indicates the critically important nature of having a shared vision for solid waste management in Denton.
- It is notable that having a shared vision is perceived as being similarly important and impactful at a city level, as well as individual level. This suggests strong support for action as a city will strongly influence and shape individual household and business behavior.

3.3 KEY DRIVERS ANALYSIS

To analyze the perceived drivers and influences on solid waste management and recycling in Denton, survey participants were asked about the importance of changes to some topic areas over time, as well as Denton's performance in addressing these drivers of change.

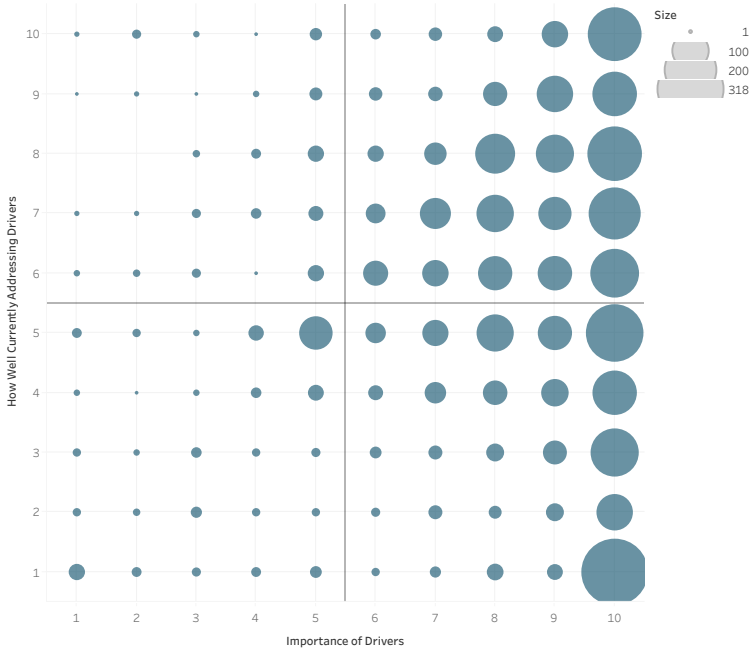
3.3.1 KEY DRIVERS – IMPORTANCE AND PERFORMANCE

Survey respondents were asked about the importance of 18 key drivers of change as they relate to solid waste management in Denton. Respondents were also asked to rate the city's current performance in addressing each of these drivers.

Pivot Chart - Importance of Drivers X How Well Currently Addressing Drivers - All Data

X axis is Importance of Drivers - Scale: 1= Not at all important; 10 = critically important.

Y axis is How Well Currently Addressing Drivers - Scale: 1= Not very well; 10 = Very Well.



Key Drivers

- Alignment of Federal and State Regulations with Local State Solid Waste Reduction goals
- Changing solid waste management regulations
- Climate change and sustainability efforts
- Collaboration with other cities and private companies
- Denton citizens' desire for sustainable solid waste management
- Efforts to increase food waste diversion
- Enhanced efforts to decrease contamination in the recycling stream
- Focus on waste reduction and reuse
- Implementation of cost effective solutions
- Importance of cost effective solutions
- Importance of education focused on behavior change
- Increase producer's/manufacturer's responsibility for materials reuse and recycling
- Markets and pricing for recyclable materials
- More efficient distribution and transportation systems
- New Materials recovery (recycling) technologies
- Preservation of the useful life of the City's landfill
- Product packaging design changes
- Solid waste conversion technologies (e.g. energy from waste)
- Waste diversion and recycling goals

DataInsight

DATA INSIGHTS:

- This data represents the results for all drivers. It shows that a very high level of importance attributed across the set of 18 drivers. This is reflected in the responses being concentrated to the right-hand side of the chart. Sorting by individual drivers shows no real difference between each of the 18 drivers.
- There is a much wider spread in perception of how well the city is currently performing for the drivers – with a very large spread from 'Not very well' to 'Very well' on the Y-axis.
- A significant number of respondents recorded 'Don't know' on the question of 'How well is the city currently address each driver'.

3.3.2 IMPACT OF AGE ON RESPONDENT PERCEPTION

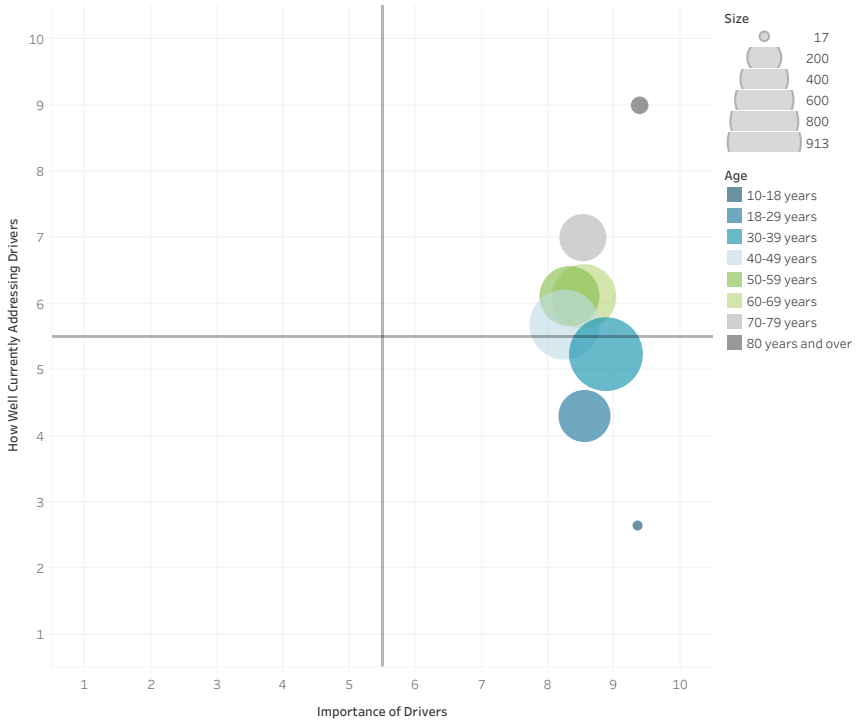
The data on the importance and performance questions was also sorted by age cohorts. The results for responses to all drivers was group by the 10-year age cohorts. This analysis allows a better understanding of the perspectives of various groups within the community. The data shows an incredibly interesting distribution. In terms of a perception of how well the city is currently addressing these drivers, the continuum goes from young people saying, 'Not very well' to more senior cohorts saying, 'Very well'. This reflects broader societal attitudes and reflects the heightened awareness and sensitivity to these issues with emerging age groups.

Emerging generations exhibit much greater awareness and sensitivity to environmental impacts. This is important when shaping a 10- to 20-year strategy, as these emerging values will likely be the predominate societal views in the future.

Pivot Chart - Importance of Drivers X How Well Currently Addressing Drivers - Cohort by Age

X axis is Importance of Drivers - Scale: 1= Not at all important; 10 = critically important.

Y axis is How Well Currently Addressing Drivers - Scale: 1= Not very well; 10 = Very Well.



DataInsight

DATA INSIGHTS:

- This data is the results for all drivers. It shows that a very high level of importance attributed across the set of 18 drivers. This is reflected in the responses being concentrated to the right-hand side of the chart.
- Younger and older cohorts are outliers in the perception of how well the city is currently addressing these drivers.

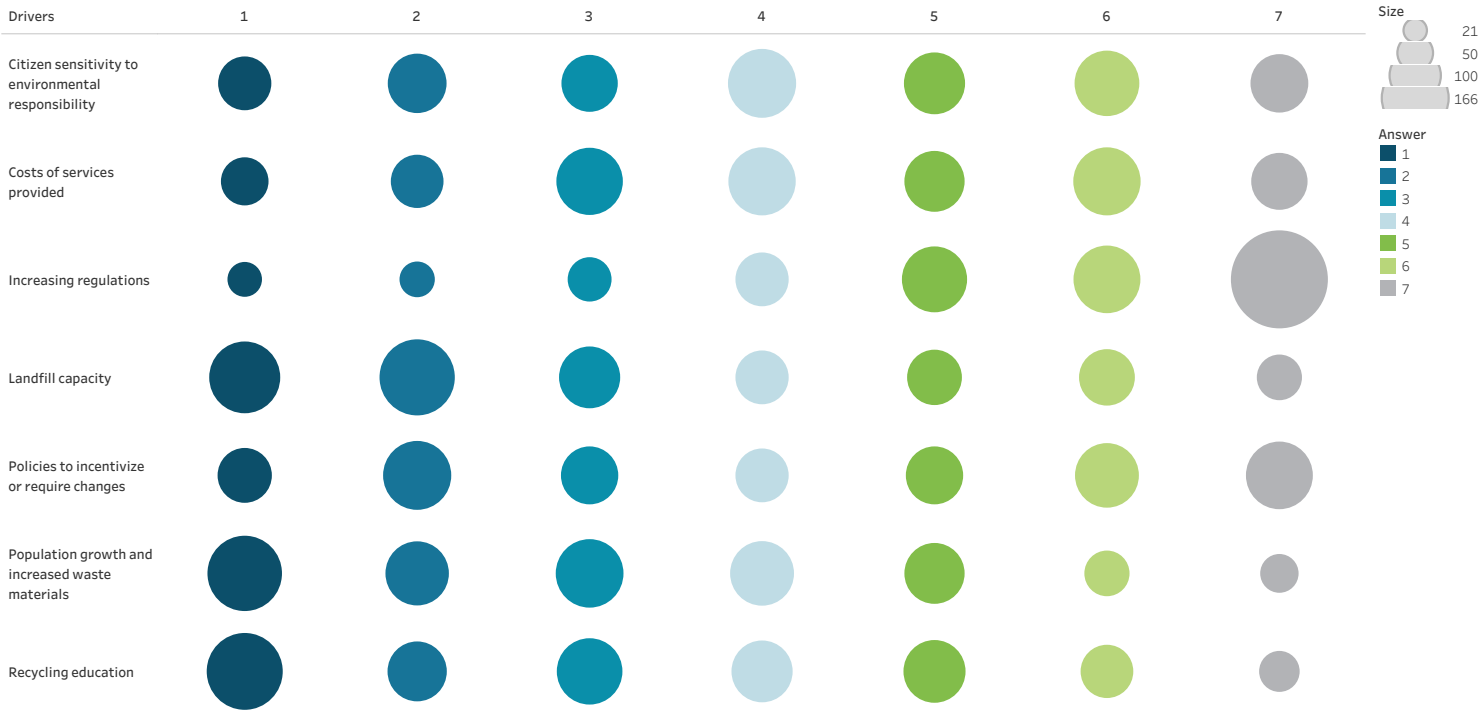
3.4 RANKING OF KEY FACTORS IMPACTING SOLID WASTE MANAGEMENT

To gauge the relative importance of certain factors and their impact on the future of solid waste management in Denton, survey respondents were asked to rank seven factors. These had been identified by the City of Denton team as important to the future of solid waste management.

RANKING OF FACTOR

In terms of their impact on the future of solid waste management in Denton, please rank the relative importance of the following factors

SCALE: 1 = Most important; 7 = Least important



DataInsight

DATA INSIGHTS:

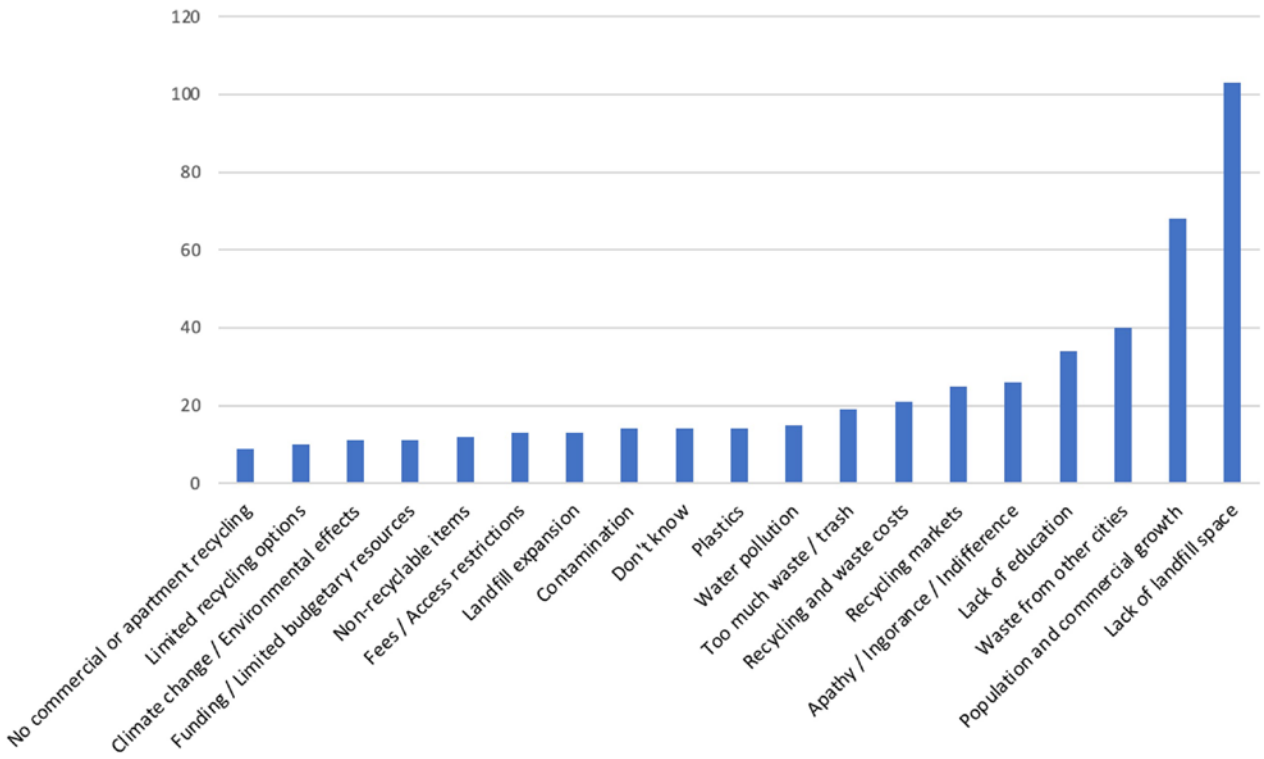
- Recycling education, population growth and increased waste materials, and landfill capacity were identified by survey respondents as the three most important factors.
- Changes in citizen sensitivity to environmental responsibility will be important elements in gaining support for Denton's new comprehensive solid waste management strategy.

3.5 VIEWS OF THE FUTURE – THREATS FACING SOLID WASTE MANAGEMENT IN DENTON

An effective comprehensive waste management strategy will require increased community education about the benefits of sustainable strategies and to deal with issues of apathy, ignorance, and indifference towards the issue.

As a measure of where community stakeholders considered the City of Denton unprepared or threatened by future impacts, survey respondents were asked to cite in narrative form what they believe are the biggest threats facing solid waste management in Denton looking out to 2040. Initial results show considerable concern over lack of landfill space, population and commercial growth, collection of waste from other cities and lack of stakeholder education as primary concerns.

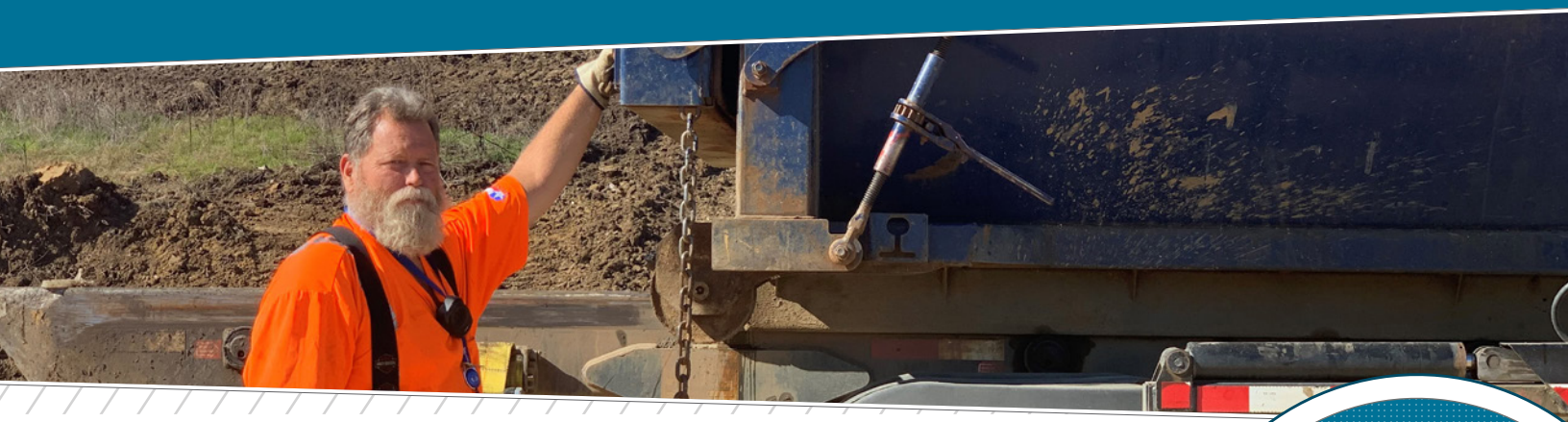
What do you think are the biggest threats facing solid waste management in Denton in the future? (n=453)



DataInsight

DATA INSIGHTS:

- Addressing perceived threats to waste management will take significant and sensitive leadership in order to achieve the desired effects of a post-pandemic comprehensive solid waste management strategy in Denton.
- The reliance on recycling markets for discarded recycling products directly impacts Denton's ability to achieve effective solid waste management and recycling goals for the city.

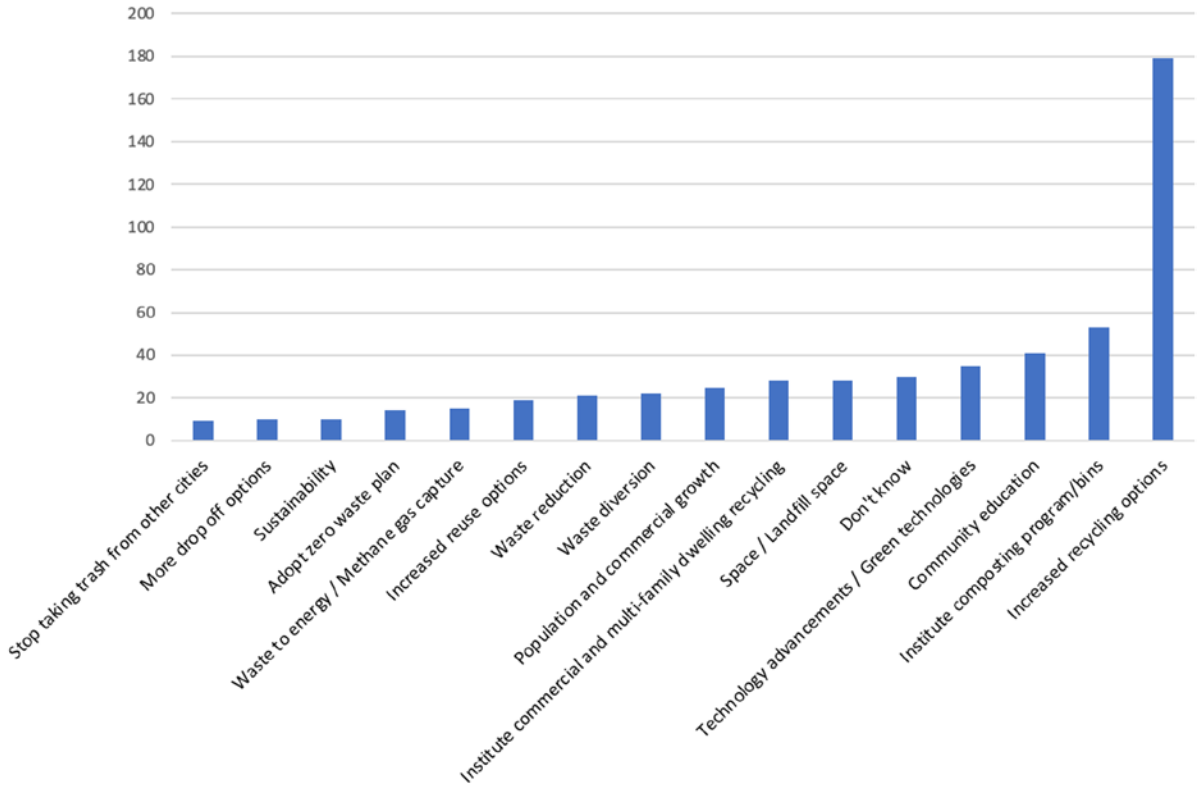


3.6 VIEWS OF THE FUTURE – OPPORTUNITIES FACING SOLID WASTE MANAGEMENT IN DENTON

The messaging surrounding the opportunities facing solid waste management in Denton in the future will be key in gaining public support for necessary policy changes.

In order to ascertain where the City of Denton should focus its efforts on leveraging resources, survey respondents were asked to describe in narrative form what they believed were the greatest opportunities for future solid waste management in the city looking out to 2040. Increased recycling options were overwhelmingly identified as the greatest opportunity, followed by instituting a community composting program, increasing community education and consumer awareness about waste management options, and advanced technologies.

What do you think are the biggest opportunities facing solid waste management in Denton in the future? (n=436)



DataInsight

DATA INSIGHTS:

- Survey respondents revealed an out-sized appetite for increased recycling options in Denton. This provides the city a mandate to address recycling options.
- Given the considerable number of respondents who indicated they didn't know any opportunities or threats facing solid waste management in Denton in the future calls for an increase in community education on the topic.

4.0 SCENARIO-BASED THINK-TANK

The scenario planning process allowed Denton community stakeholders to examine the implications of choices about future direction for solid waste management and recycling.

Denton's scenario-based Think-Tank modules were conducted virtually over the course of three two-hour workshops in April 2021. Approximately 20-25 people attended these workshops that included city staff, community members, industry, and agency representatives. The Think-Tank modules were intended to build coherency around a vision for initial future planning for solid waste management and recycling in Denton that will guide community stakeholders over the next twenty years.

The scenario planning process provides a method to explore plausible futures and consider the implications of various future scenarios. The Think-Tank workshops aimed to:

- Deepen the understanding and examination of how external events and local conditions could shape decision-making
- Identify and understand the key influences, trends, and dynamics that will shape the solid waste management and recycling looking out to 2040
- Create and describe four plausible long-term scenarios for the City of Denton
- Explore alignment around a shared future vision
- Examine the strengths and weaknesses of the current solid waste management strategy in Denton as perceived by community stakeholders

The scenarios developed during the scenario planning process and outlined in this report are important to provide a framework to discuss future possible outcomes and implications for sustainable solid waste management and recycling in Denton. In addition, the Think-Tank deliberations can assist in identifying key actions for the city and in exploring how various groups might collaborate to best contribute to future policy-making.

Think-Tank participants were guided through a scenario planning process to develop four plausible scenarios for the future of solid waste management in the City of Denton. The process involved exploration of local trends and forces of change; development of a scenario matrix defining four plausible scenario spaces for the future; and, the development of descriptive narratives of each scenario. The event concluded with discussion of the scenarios, selection of a preferred scenario, and consequences of inaction.

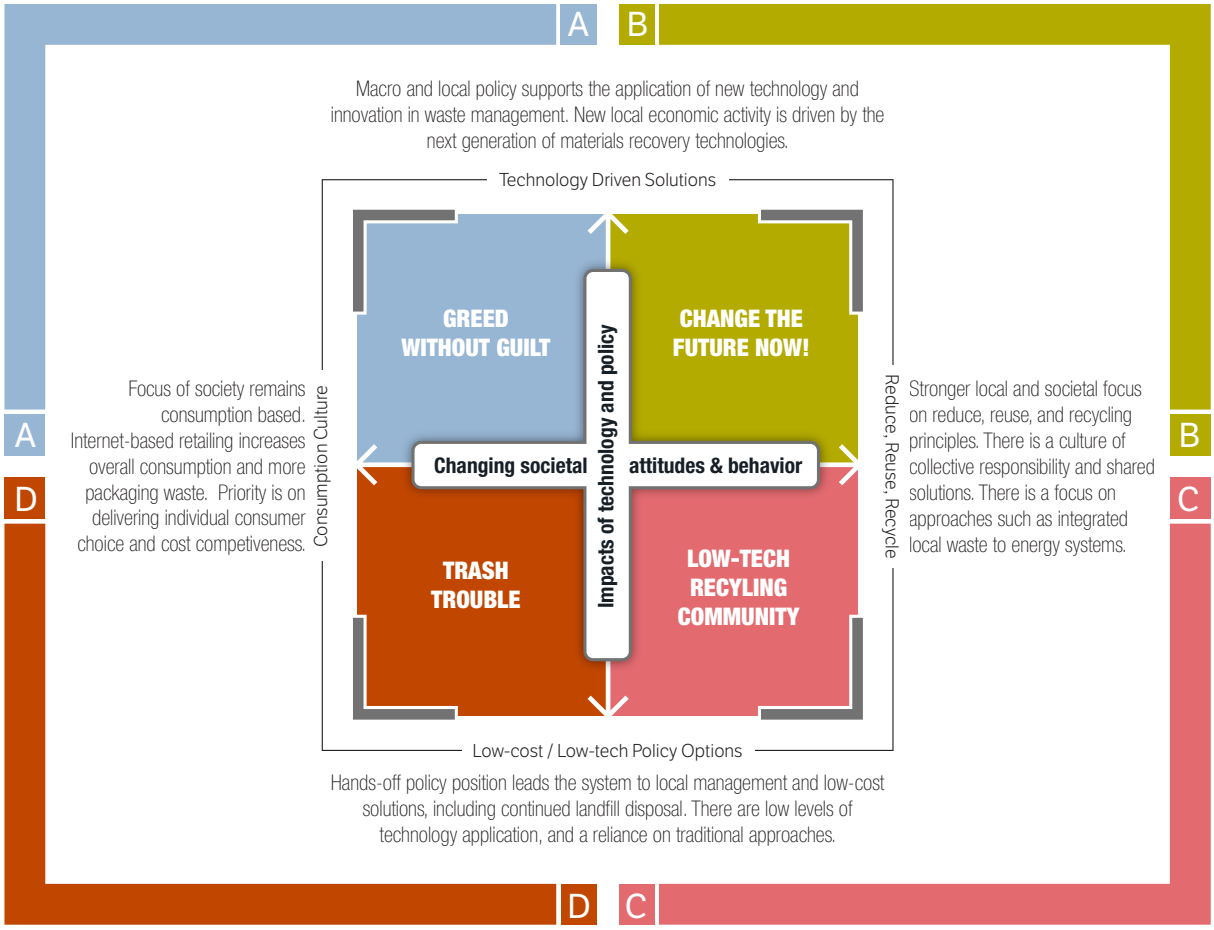
FUTURE-SPLITTING QUESTIONS™

The scenario-planning process provides a way to tease out plausible future scenarios and examine them from a speculative standpoint. They represent different possibilities for the future.

5.0 CREATING THE SCENARIO FRAMEWORK

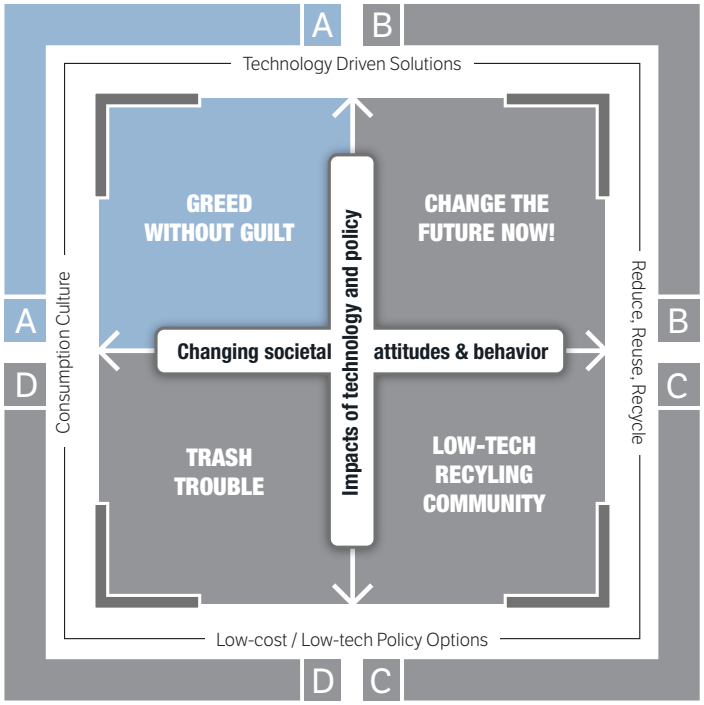
Based on the community survey responses and key input from city staff, themes were identified to become the basis for two axes on the scenario matrix. The two axes identified were **Changing Societal Attitudes and Behavior** and **Impacts of Technology and Policy.**

Think-Tank participants were presented with the scenario matrix, defined by the two major axes of 'Changing Societal Attitudes and Behavior' and 'Impacts of Technology and Policy' (see diagram). Brief descriptions were also attached to the end points of each driver axes. Participants were divided into four groups to develop a narrative for each scenario. Each group was asked to describe the characteristics of solid waste management in 2040 under the conditions of the scenario quadrant that they had been given. After the characteristics were established, Think-Tank participants were asked to devise major events or headlines of how the scenario occurred using the years 2025, 2030, and 2040, and to give their scenario a descriptive name. Narratives and descriptions of each scenario as developed by the workshop participants are included in the following sections.



5.1 SCENARIO A: GREED WITHOUT GUILT

This scenario forecasts a future where societal attitudes and behaviors continue to espouse a culture that is consumption oriented, and no efforts are made to reduce materials use or waste production. Online retail continues to increase, and priority is given to accommodating individual consumer choice above all else. Increasing amounts of waste spur technological innovation to deal with the ramifications of excess and new types of packaging that rely on plant-based solutions are created. The City of Denton no longer allows residents to sort their own trash and the city utilizes cutting edge technologies to sort and mine its waste. At first new technologies allow consumption culture to continue uninhibited, and mined waste is sold to support the expense of new technologies. Use of anaerobic digestion increases, and new public-private partnerships are formed to come up with new solutions for dealing with waste. However over time, the City is ultimately unable to keep up with resource use and waste production.



The 'Greed without Guilt' scenario paints a future where a growing consumption culture necessitates the use of technology driven solutions in solid waste management. These solutions cannot mitigate the impacts of unlimited resource and waste production over time.

In the 'Greed without Guilt' scenario, the world's finite resources are slowly depleted. Technology driven waste management solutions mask the effects of unmitigated consumption until the world runs out of those natural elements that cannot be reproduced.

SCENARIO A CHARACTERISTICS: GREED WITHOUT GUILT – 2040

To deal with the effects of a culture oriented to consumption, the characteristics of this scenario paint a future where the City of Denton adopts policy settings that lean heavily towards innovative technological solutions for solid waste management. New generation technologies in packaging, sorting, and mining all help to stave off the effects of unlimited consumption, but over time municipalities are unable to keep up with waste production and the associated costs.

Consumption Patterns and Waste Types

Waste stream increases dramatically, and packaging types vary more.

- Technology provides more varied and robust packaging including plant based.
- Organics become the next food as intensive agriculture increases.
- Denton sorts all trash for residents; residents no longer need to sort.

Policy Setting and Application of Technology

Policies are driven towards technological solutions as waste stream increases.

- Policy makers turn to industrial infrastructure to sort, process, and handle waste.
- Mining waste streams becomes critical for energy production.
- As cost of processes decrease, new technologies are adopted.

Waste Management Systems Being Utilized

Waste management is localized, and a variety of systems are utilized to deal with increased waste.

- New public-private partnerships are formed with companies to sort waste.
- More metals are reclaimed from electronics as new recovery technologies are adopted.
- Denton begins to sell its sorted waste as landfill fills up.

2025 HEADLINE NEWS:

"Denton puts your trash to work"

2030 HEADLINE NEWS:

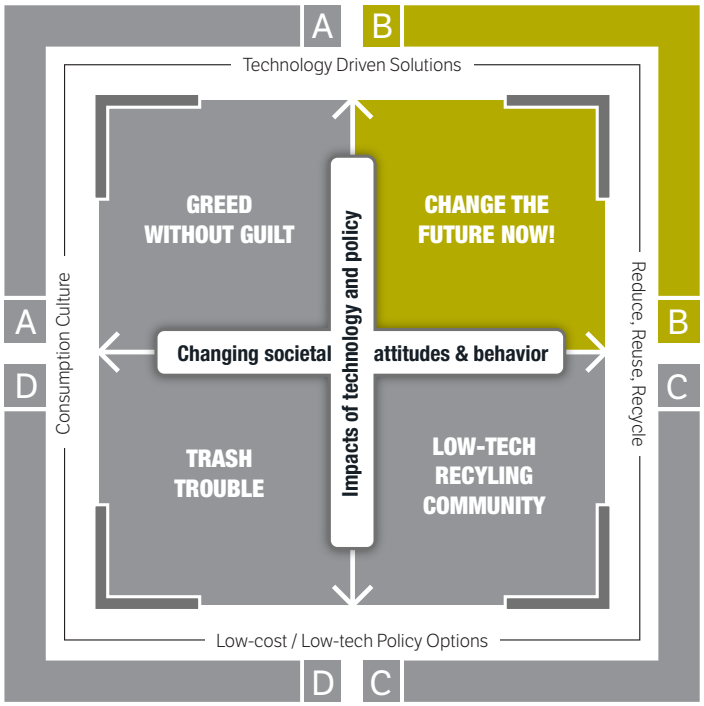
"Your trash is our treasure"

2040 HEADLINE NEWS:

"No such thing as waste"

5.2 SCENARIO B: CHANGE THE FUTURE NOW!

This scenario forecasts a future where Denton community stakeholders understand their critical role in the waste management process and fully support reduce, reuse, recycle principles. Stakeholders are environmentally conscious and are willing to make investments in innovative next generation technologies necessary to achieve zero-waste goals. By 2040, these technologies including sensors and robots can sort, identify, and capture any type of material and make use of it. Contamination is easily detected by monitoring systems and anaerobic digesters are used to produce energy for city vehicles. The ideal of a complete closed-loop system is sought and policy settings follow suit. Solid waste management expands from the local level to a systems-wide approach within the State of Texas.



The 'Change the Future Now!' scenario paints a future where society maintains a culture of collective responsibility and shared solutions for solid waste management. Advanced technologies move solid waste management towards total capture and closed loop systems.

In the 'Change the Future Now!' scenario, continuous investment in consumer education about waste management pays off and produces policy settings that set the community on a path to achieve its zero-waste goals.

SCENARIO B CHARACTERISTICS: CHANGE THE FUTURE NOW! – 2040

The characteristics of this scenario paint a future where community consumption patterns reflect attitudes and behaviors that are fully supportive of reduce, reuse, recycle principals and accept collective responsibility for sustainable waste management policies. Advanced technologies are embraced to sort, identify, and capture all waste types and new markets expand for Denton's waste products.

Consumption Patterns and Waste Types

There is continuous investment in consumer education with a focus on collective responsibility and shared solutions.

- Community stakeholders are fully supportive of 'reduce, reuse, recycle' principles.
- Community stakeholders understand their role in waste management and are incentivized to change behaviors.
- All types of waste are collected and fully utilized.

Policy Setting and Application of Technology

Advanced technologies make use of all waste and policy settings are graduated to ensure that there will be no need for landfill use after 2040.

- Technologies can sort, identify, and capture any type of material and make use of it.
- Increased use of sensors and robots make sorting 100% efficient and creates markets for waste use.
- Policies only allow use of recyclable materials for all packaging and construction.

Waste Management Systems Being Utilized

Solid waste management expands from the local level to a systems-wide approach within the State of Texas.

- Route monitoring occurs to identify with precision where contamination occurs.
- Capture and conversion of CO2 and methane to energy is a normalized process in waste management.
- Landfill mining occurs to empty the landfill.

2025 HEADLINE NEWS:

"In the 'Change the Future Now!' scenario, continuous investment in consumer"

2030 HEADLINE NEWS:

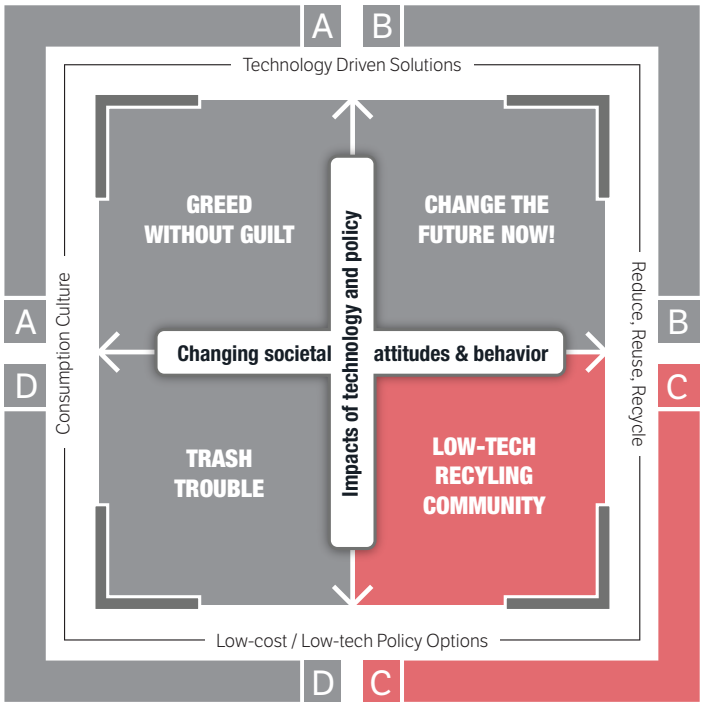
"Denton County leads Dallas County in recycling numbers"

2040 HEADLINE NEWS:

"Organics provide all power for the City of Denton"

5.3 SCENARIO C: LOW TECH RECYCLING COMMUNITY

This scenario forecasts a future where community stakeholders have a high-level understanding of the impacts of waste on the environment, but there is no political will to pursue high-cost technical solutions at the governmental level. The focus remains on localized, low-tech solutions such as the landfill, combined with low-cost reduce, reuse, recycle remedies. Creative low-tech solutions such as drop-offs, reusable containers, gamifying recycling, interest in reuse 'garbage to gold', and incentives for participation are popular waste management initiatives. As new technologies age and become less expensive over time, they are added to Denton's waste management strategies. This low-cost, low-tech approach is problematic in the long run, as the city is unable to keep up with consumer and producer waste production and the landfill reaches capacity.



The 'Low Tech Recycling Community' scenario paints a future where the desire to keep costs low impedes Denton's ability to be a leader in waste management initiatives, and the City is unable to keep up with waste production.

In the 'Low Tech Recycling Community' scenario, the savvy community stakeholder pushes for low-tech, low-cost options while promoting 'reduce, reuse, recycle' principles.

SCENARIO C CHARACTERISTICS: Low Tech Recycling Community – 2040

The characteristics of this scenario paint a future where Denton community stakeholders are highly aware of the benefits of environmentally sustainable waste management strategies, only there is no political will to pay for them. Policy settings are set at low-tech, low-cost levels with an emphasis on recycling and landfill solutions. Denton is a follower, not a leader in waste management technologies.

Consumption Patterns and Waste Types

Consumers have a high-level understanding of environmental impact and financial implications.

- Society has a high desire to reduce, reuse and recycle, and practices conscientious consumerism.
- Manufacturers adopt recyclable packaging with extended lifecycles.
- Waste shed area is micro-local with neighborhood focus.

Policy Setting and Application of Technology

Policies do not provide funding for next generation waste management technologies and low-cost solutions continue.

- Denton continues to use the landfill while at the same time promoting 'reduce, reuse, recycle' principles.
- Taxing is based on consumption and there are repercussions for contamination.
- With no appetite for technology investments, the focus is on education.

Waste Management Systems Being Utilized

Waste management systems continue to be local with focus on recyclables and reuse.

- Recycling is required and incentives are provided for participation.
- City expands reuse options and accepts more items at the reuse shed.
- Denton is a follower, not a leader in waste management technologies.

2025 HEADLINE NEWS:

"Residential recycling outpaces residential waste across Denton"

2030 HEADLINE NEWS:

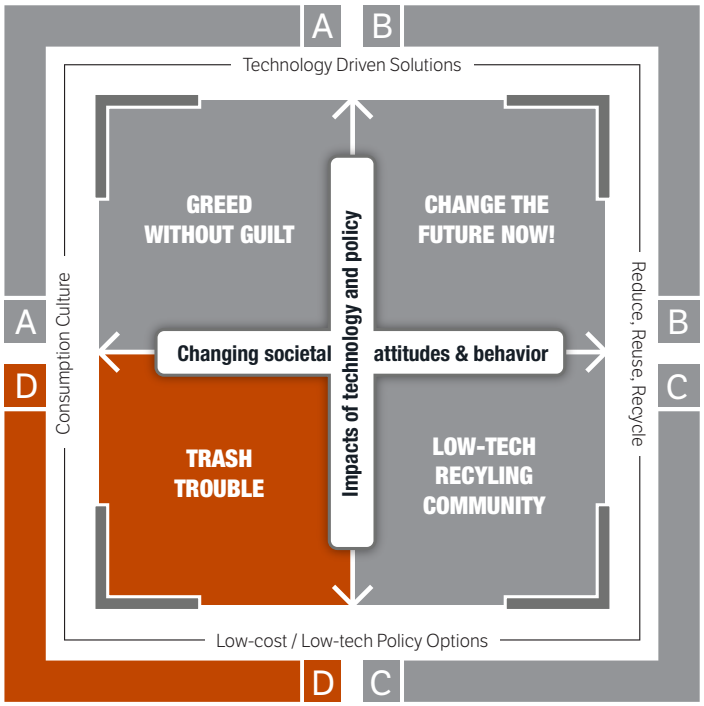
"Pop up reuse stores a growing sector for Denton businesses"

2040 HEADLINE NEWS:

"No more confusion over what can go in the bin"

5.4 SCENARIO D: TRASH TROUBLE

This scenario forecasts a future where the effects of excessive consumerism without regard for the environment slowly overwhelms the City of Denton's solid waste management system. A low-cost, low-tech policy orientation adds to the city's burden of dealing with waste and the landfill remains the go-to solution. With no funding or political support to pursue newer materials recovery technologies, costs rise as the landfill reaches capacity and forces the city to search for other lower-cost solutions such as incineration. Consumers don't help the situation with low recycling participation rates and increased litter and illegal dumping to avoid high waste collection costs. Food and recycling waste fills up the landfill at an exponential rate. Sanitation issues arise with illegal dumping and this creates a breeding ground for viruses such as the Zika virus.



The 'Trash Trouble' scenario paints a future that portrays the worst-case scenario for the City of Denton. The combined effects of reliance on traditional approaches to waste management and climate change would have severe negative consequences on quality of life for animals and humans in Denton.

In the 'Trash Trouble' scenario, irreparable harm occurs to the living environment of Denton. Severe losses occur in the areas of water, air, resources, and land.

SCENARIO D CHARACTERISTICS: TRASH TROUBLE – 2040

The characteristics of this scenario paint a future where Denton is gradually overtaken by waste and pollution, and disease spreads among animals and humans. The impacts of a low-cost, low-tech approach to solid waste management and recycling cannot keep up with a consumption-focused society and resources are slowly depleted.

Consumption Patterns and Waste Types

Consumers have no regard for environmental sustainability and make no effort to reduce, reuse, or recycle.

- Low participation rates in recycling programs exponentially decreases landfill capacity.
- Limited recycling services restrict recycled items to only most valuable commodities.
- Landfill reaches capacity and increased illegal dumping occurs.

Policy Setting and Application of Technology

Lack of progressive policies restricts investment in new technologies as the City seeks low-cost, low-tech options.

- With no concern for carbon mitigation, the most polluting collection vehicle technologies are used.
- Individual homeowners and businesses pay for all waste management services disincentivizing participation.
- Costs increase for customers as consumption and waste production increase.

Waste Management Systems Being Utilized

Reliance on traditional approaches to waste management increases illegal dumping, pollution, and tipping fees.

- Consumption-based consumer focus increases waste quantities headed to the landfill.
- Costs rise as the landfill reaches capacity and the City searches for other low-cost solutions.
- Sanitation issues arise with illegal dumping and creates breeding grounds for viruses.

2025 HEADLINE NEWS:

"Landfill reaches new 'heights'."

2030 HEADLINE NEWS:

"Illegal dumping accumulates with no sign of collection."

2040 HEADLINE NEWS:

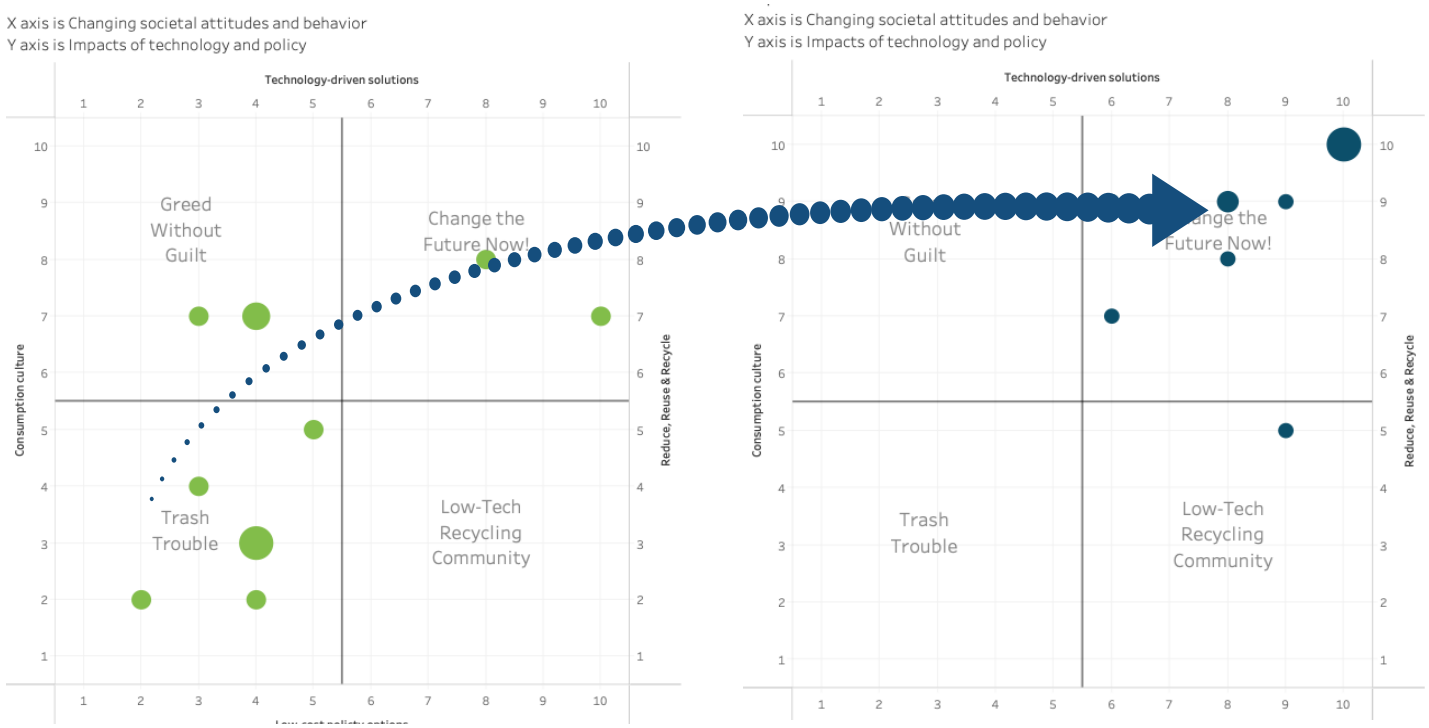
"Doomsday comes to Denton"

Because of the long-term nature of the Scenario Planning methodology, stakeholders often see the 'distant future vision (2040)' as unattainable and unrealistic. However, this underestimates the progress that can be made during the intervening years, and the cumulative positive impacts of change.

6.0 EXPECTED AND PREFERRED FUTURES

Think-Tank participants discussed the ramifications and implications of failing to achieve the preferred future. There was strong alignment among participants that Scenario B, 'Change the Future Now!' represented the preferred scenario for Denton. To get to the preferred future, there was recognition among Think-Tank participants that in addition to community behavior adjustments, policies must become more supportive of new technologies, expanded recycling options and a systems-wide approach to solid waste management.

Getting from Expected to Preferred Future



FutureInsight

FUTURE INSIGHTS:

- A definite preference for the 'Change the future now!' scenario indicates a clear mandate for the City of Denton to take actions that support that vision for the future.
- There is an expectation that with generational change, there will be a more holistic, systems-wide approach to solid waste management. The issue is how long this will take and whether humans will be able to mitigate the damage done to the planet.

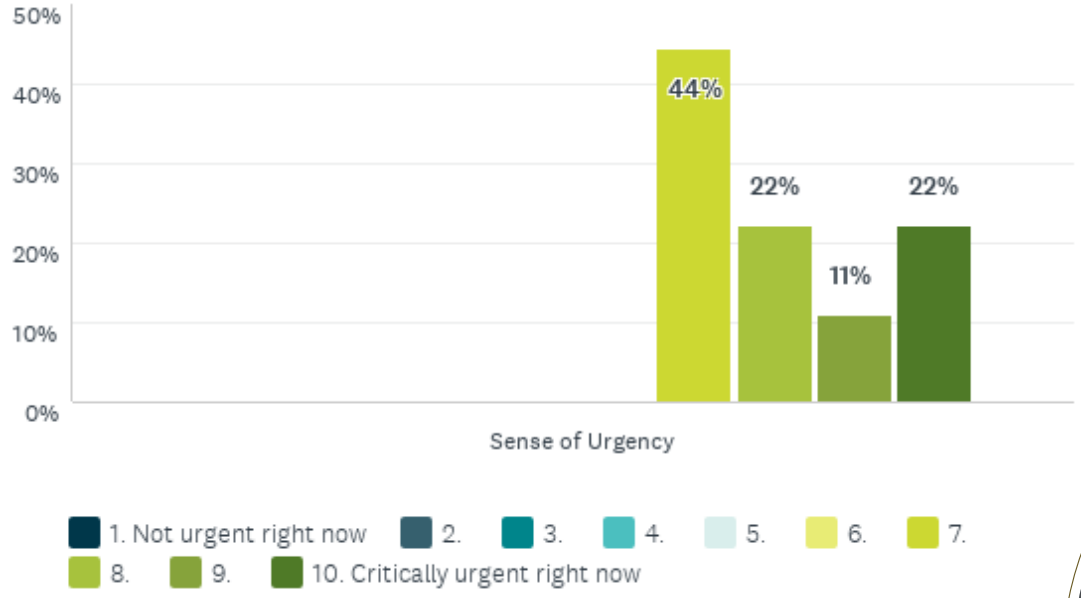
The sense of urgency reflected by survey respondents gives the City of Denton a clear mandate to institute change quickly as the community seeks to achieve their preferred future.

7.1 URGENCY TO IMPLEMENT THE VISION

The survey conducted during the Think Tank at the end of Module 3, explored the perceived sense of urgency to implement the preferred future. The results indicate a strong desire to move with urgency. This reflects a sentiment seen in the community survey results.

Sense of Urgency

Question: *How quickly do you think the City of Denton needs to adopt and pursue strategies to achieve the preferred future?* Scale: 1 = Not urgent right now; 10 = Critically urgent right now



"You are doing a great job - keep up the good work - people might moan and groan about changes for the better but they did that when seatbelt laws were enacted too and now most folks wear them.... Change takes time - just hope we have enough time to turn around the mess we have made on planet Earth."

- Denton Community Survey Respondent

FutureInsight

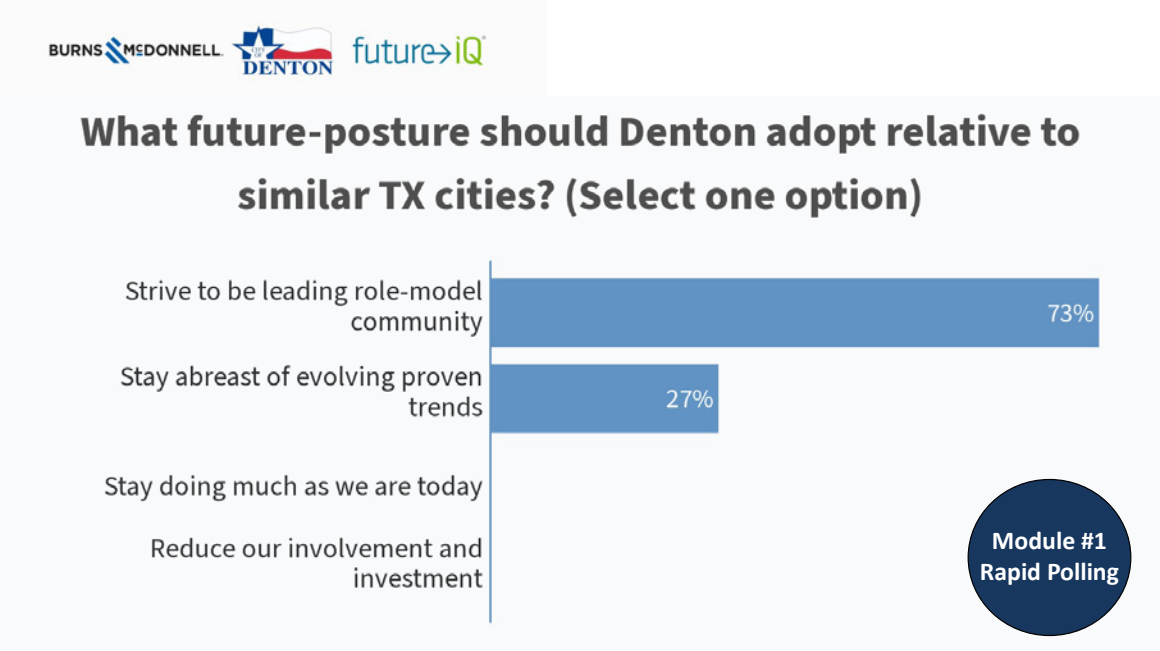
FUTURE INSIGHTS:

- Think tank participants who took the survey, rated the urgency of adopting and pursuing the vision in the 7-10 scoring range (Urgent to Critically Urgent).
- This data reflects a strong desire to move quickly. This was also reflected in Think-Tank modules 1 and 2, as well as the initial community survey.

With support from the community, the City of Denton can strive to be a leading role-model community for solid waste management in the State of Texas.

7.2 APPETITE FOR CHANGE

To gauge appetite for change to Denton's solid waste management strategy, Think-Tank Module 1 participants were asked a series of rapid polling questions. The first question asked what kind of waste management leadership role the city should take relative to similar Texas cities. The second question asked how active city should be in advocating for change. The third question asked how much respondents would be willing to pay for improved comprehensive solid waste management services in Denton.



"I think if handled correctly, Denton could easily lead the way in Texas on waste management. It would be great to see a big effort towards reducing waste of all kinds through better recycling programs, composting programs, and public education."

- Denton Community Survey Respondent

FutureInsight

FUTURE INSIGHTS:

- Module #1 participants expressed a desire to see Denton be very active in advocating at the State of local level for change in solid waste and recycling and doing so in collaboration with other municipalities.
- There was a willingness to pay more for improved comprehensive solid waste management services in Denton.

8.0 CONSULTING TEAM – TASK ONE

The Task One consulting team was led by Burns & McDonnell, with survey and visioning components delivered by Future iQ.

Future iQ specializes in applying innovative tools and approaches to assist municipalities, organizations, regions, and industries shape their economic and community futures. With nearly two decades of experience, the company has a global clientele spanning three continents.

To learn more visit
www.future-iq.com

Burns & McDonnell is a full-service engineering, architecture, construction, environmental and consulting solutions firm, based in Kansas City, Missouri. Our Solid Waste and Resource Recovery group assists public and private clients throughout North America.

To learn more visit
https://www.burnsmcd.com

The Task One Consulting Team included:

David Beurle
CEO, Future iQ

Scott Pasternak
Senior Project Manager
Burns & McDonnell

Heather Branigin
VP, Foresight Research
Future iQ

Debra L. Kantner
Solid Waste & Waste Minimization
Strategic Planner
Burns & McDonnell

9.0 ACKNOWLEDGEMENTS

Future iQ and Burns & McDonnell team members would like to thank Denton community stakeholders for their dedication and time committed to this project. Their presence at the virtual Think-Tank modules and participation in the community survey were critical elements in the success of the visioning process. We would also like to thank Brian Boerner and the staff at the City of Denton for the many hours of meetings and material support.

10.0 FOR MORE INFORMATION

For more information about Denton's Solid Waste Management Strategy Project, please contact:

Brian Boerner, Director of Solid Waste
City of Denton
Phone: (940) 349-8001
Email: Brian.Boerner@cityofdenton.com

future→iQ®
Create Future Intelligence®

CITY OF DENTON

BURNS & McDONNELL