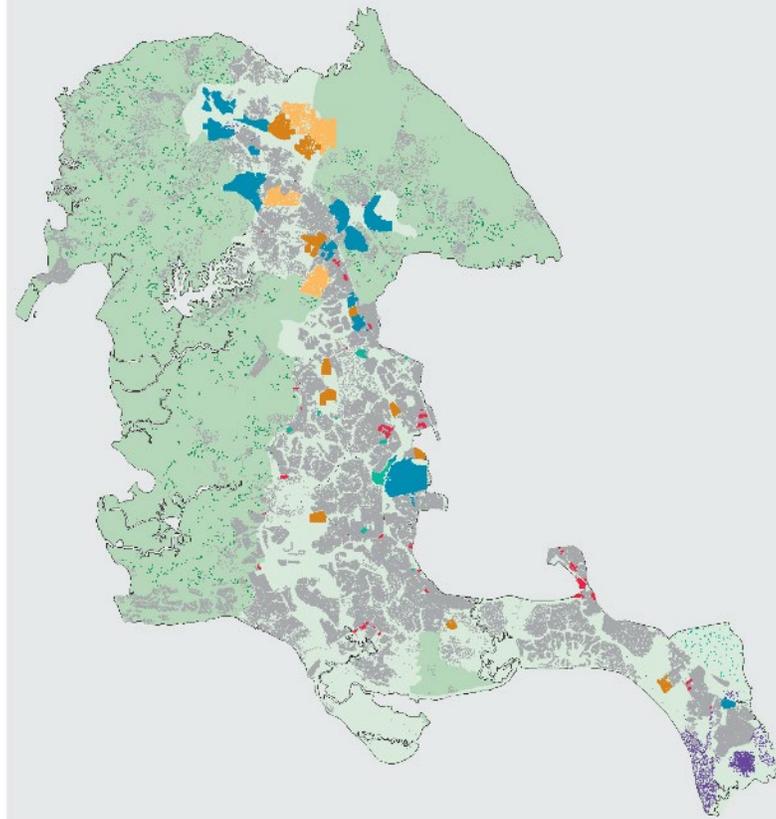




Preferred Scenario Framework



Engage 2045 James City County
Comprehensive Plan Update
September 21, 2020

Prepared by EPR,PC

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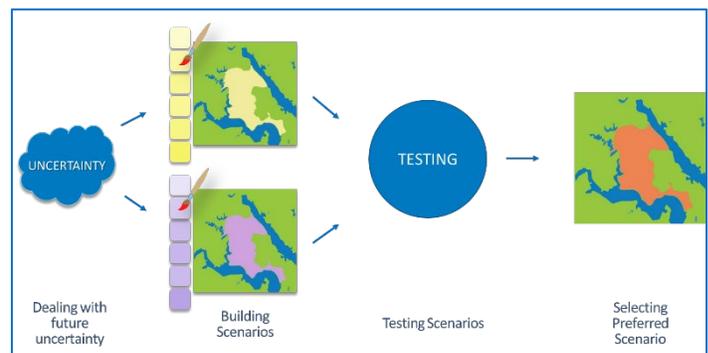
PREFERRED SCENARIO FRAMEWORK

PART 1. PREFERRED SCENARIO FRAMEWORK

Introduction

Engage 2045 is the process for updating James City County’s Comprehensive Plan. As part of that process, the County conducted a Scenario Planning process intended to provide insight to County decisionmakers regarding long term policy choices for land use and public investment in light of potential alternative future growth scenarios. The Scenario Planning process built a series of three integrated computer models used to analyze potential future land use patterns and assess the results through a public engagement process.

This document is a summary of the Preferred Scenario Framework. The Preferred Scenario Framework is the County Planning Team’s summary of a potential preferred scenario that emerged as a result of assimilating all of the public input and scenario testing results from the overall scenario planning effort. It is intended to suggest a potential preferred future vision for how James City County could grow and change in 25 years, as derived from the scenario planning phase of this project. The document describes the Preferred Scenario Framework through maps, images and words and also includes a summary of the scenario planning process, the two scenarios that were tested and the underlying planning assumptions in the Appendices.



1 Diagram describing the Scenario Planning Process. Source: EPR, PC

General Approach & Public Input Basis:

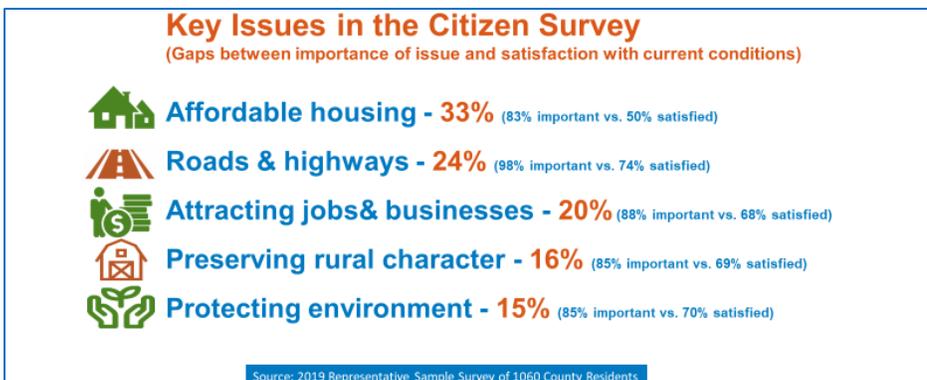
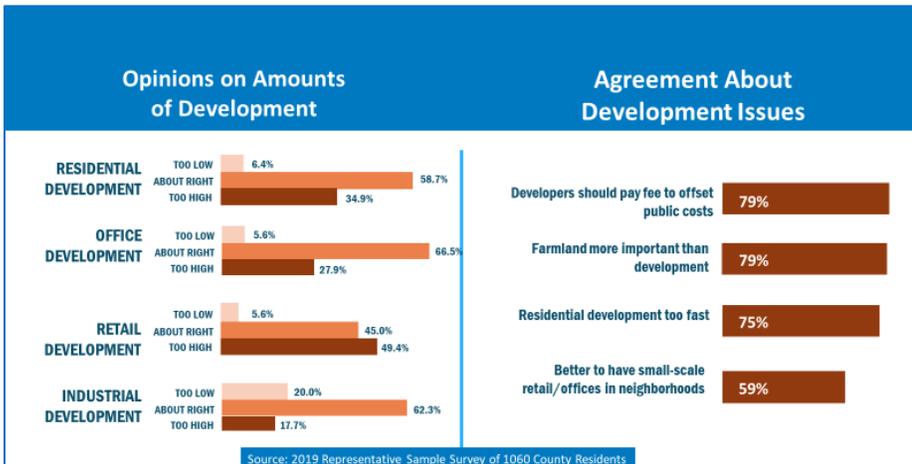
The Preferred Scenario Framework has been developed based on several sources. These included a number of public engagement efforts and several workshops with the Planning Commission Working Group, Board of Supervisors and Community Participation Team. It also includes the results of the computer modeling of the scenarios. The sources used to develop the Preferred Scenario included:

- Public input from the November 2019 Summit on the Future, as summarized and themes by the Community Participation Team
- Public input from the 2019 Citizen Survey
- Input from the Planning Commission Working Group and Board of Supervisors through briefings and meetings in 2019 and 2020
- Results of the scenario testing by the County Planning Team as shared with the public at the 2020 Assembly on Alternatives

The public involvement for the Engage2045 process greatly exceeded prior comprehensive plan efforts in terms of both the number of responses and the variety of means for engagement. The involvement for this process is far from over but to date, the number of participants/respondents includes:

- 185 in person public meeting attendees
- 392 respondents to online surveys
- 1,000 respondents to phone surveys

The 2019 citizen survey in particular was a statistically valid, random sample survey of citizens and yielded a high response rate. Some of the results from this survey that are relevant to the development of the Scenarios are shown below:



2 Slides showing some of the results of the 2019 Citizen Survey, presented at the 2019 Summit on the Future

Thus, the Preferred Scenario Framework was developed based on both the scenario testing through the computer models and on the public input received. The Preferred Scenario Framework was developed by taking key elements from the public input and testing and combining them into an overall framework described in terms of words, images, and mapping. The 2020 Assembly questionnaires and particularly the “Exploring Future Alternatives” questionnaire showed extensive support for Scenario B (Alternative) and key elements from this scenario were a starting point for the Preferred Scenario Framework. To this were added refinements to incorporate other elements of public input from both the November 2019 Summit and 2019 Citizen Survey that gave additional guidance on how the

public saw a preferred vision for the future of the County. Finally, further refinements were added based on results of the scenario modeling and testing to more closely match the themes from the public input comments received.

The Preferred Scenario Framework is described in this document through three key aspects:

1. Preferred Scenario Policy Themes:
 - These describe in narrative form the key elements of public input received and the potential policy implications that are built into the Preferred Scenario Framework, based on each of the five public input themes
2. A Future Place Type Concept Map
 - A concept map that shows a very general and “high altitude” vision of potential future Place Types countywide
3. Additional Planning Concepts
 - Some additional concepts added by the Planning Team that describe and illustrate some of innovative planning approaches that could be incorporated into future planning for the County as key features of the Preferred Scenario Framework.

The Appendices also describe the overall scenario planning and modeling process and each of the tested scenarios in greater detail.

Public Input on Scenarios

The Exploring our Future Alternatives Assembly, conducted on August 10th, 2020 offered an online questionnaire concerning alternative future scenarios for public response that ran for three weeks until September 2nd, 2020. This survey, conducted through the interactive MetroQuest platform presented two alternative scenarios for the public to review. The scenarios were presented in a series of panels that described each scenario through “maps, images and numbers.” The narratives for each scenario are listed below:



3 Public input on the scenarios was gathered through the interactive online MetroQuest platform. Source: EPR,PC

Scenario A. (Trend)

- Current land use trends and development patterns continue
- Dispersed single family development and retail centers.
- Protection of rural areas is encouraged but some level of development of Rural Lands (areas outside the Primary Service Area) continues.

Scenario B. (Alternative)

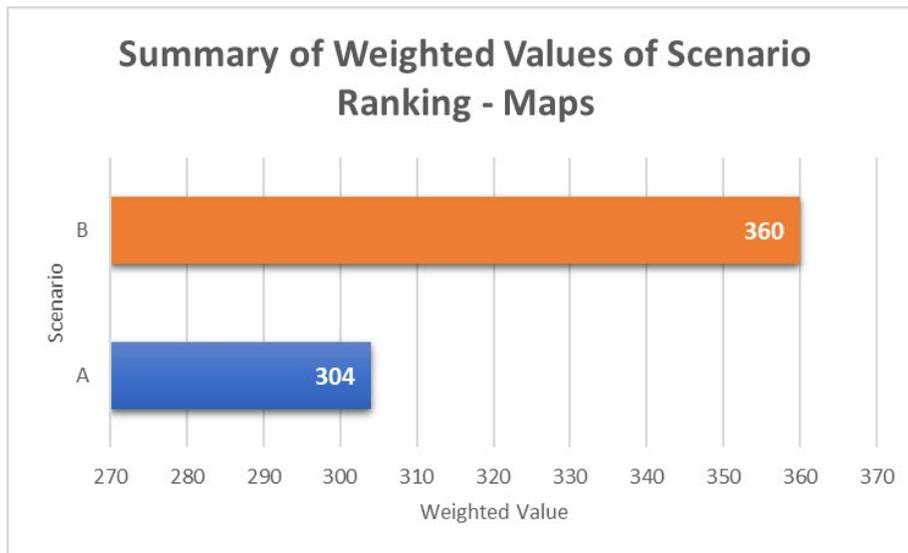
- Rural lands outside the Primary Service Area used primarily for rural and agricultural purposes instead of development
- More protections for rural lands
- More focus on infill and redevelopment
- Economic development at higher densities in the Primary Service Area but in concert with existing community character.

The survey was extensive and contained over two dozen questions that asked people to study maps, images and summary charts that described the results of computer model testing of each scenario with respect to each of five public input themes (Nature & Environment, Community Character, Affordable Housing, Economic Development and Quality of Life). In total, 136 people completed the survey in the three-week period, which was a considerable response rate for such a complex and detailed survey.

The results of the Questionnaire are summarized in Appendix 6, and summaries of the survey results are shown below. It should be noted that survey respondents were asked to rate each scenario after looking through a series of maps, images and numerical charts that showed how each scenario performed under computer modeling. The responses in all cases were done in the form of 1 to 5 stars, with 1 star being “furthest from your vision for the County for the future,” to 5 stars being “closest to your vision for the County in the future.”

Below are shown summary results comparing the responses to each Scenario. The scores were compared between scenarios to show how much one scenario's score differed from the other using a weighted value (see Appendix 6 for a description of this measure and for complete results):

1. Maps

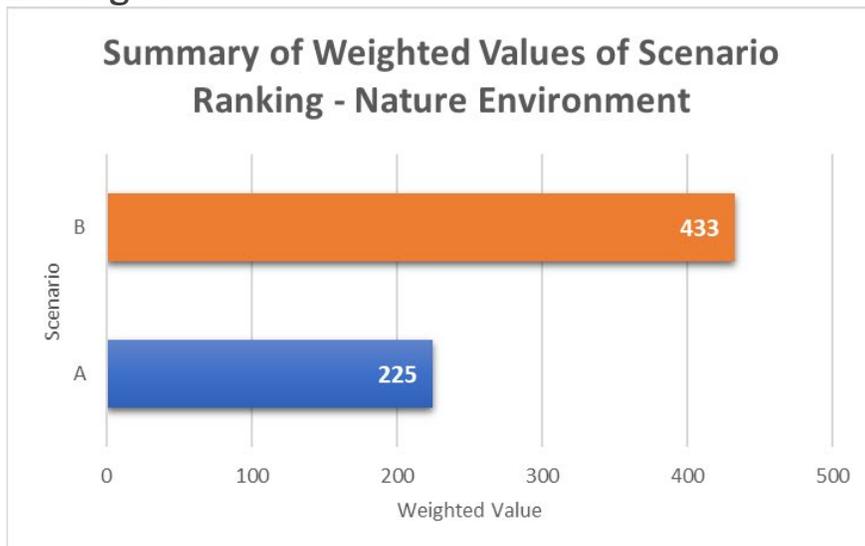


Scenario B had an overall more positive ranking than Scenario A of:

118%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

2. Images

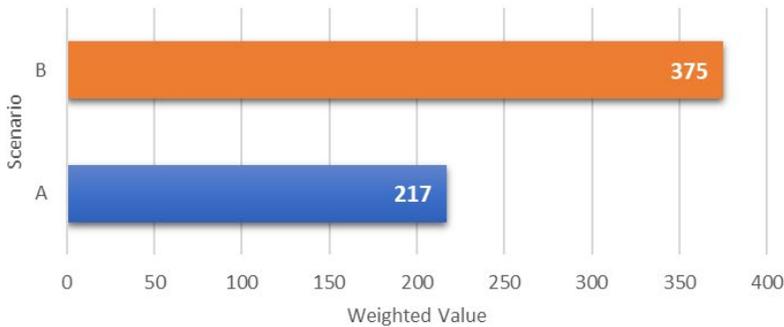


Scenario B had an overall more positive ranking than Scenario A of:

192%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

Summary of Weighted Values of Scenario Ranking - Community Character

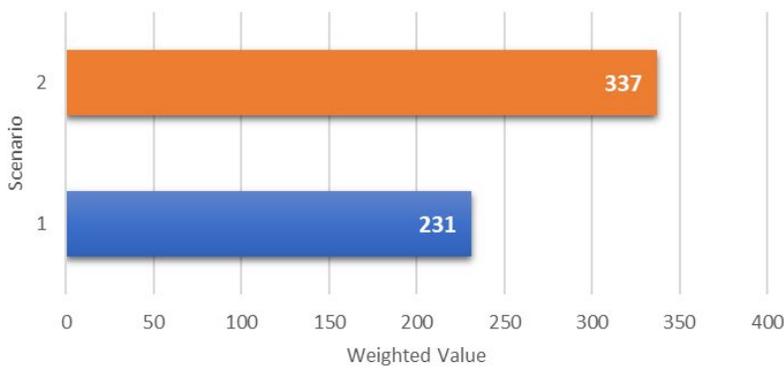


Scenario B had an overall more positive ranking than Scenario A of:

173%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

Summary of Weighted Values of Scenario Ranking - Affordable Housing

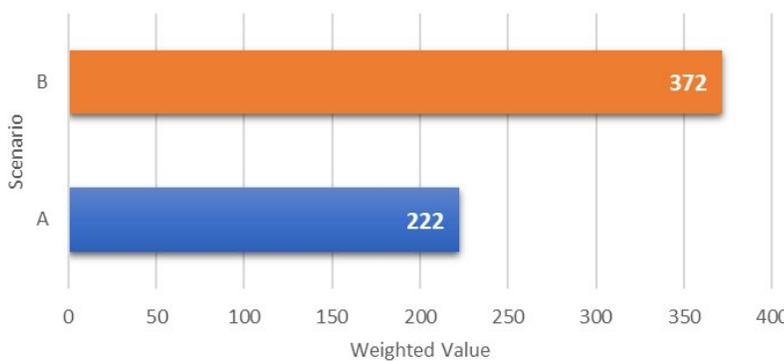


Scenario B had an overall more positive ranking than Scenario A of:

146%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

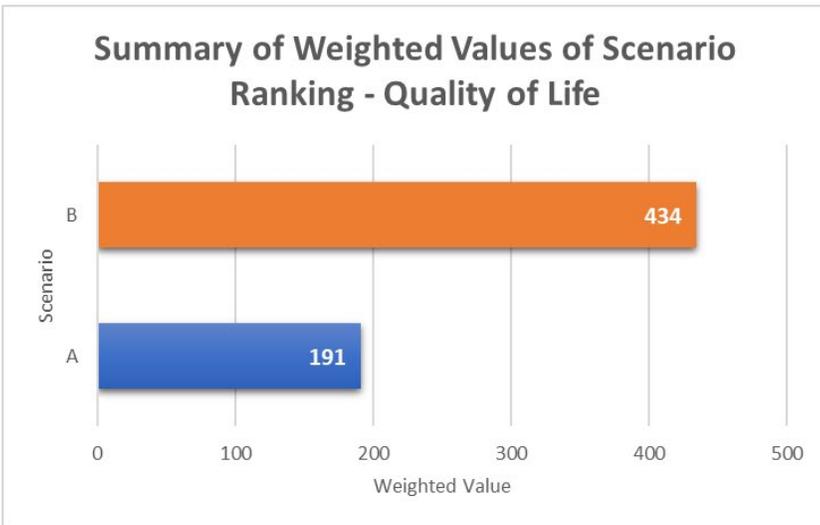
Summary of Weighted Values of Scenario Ranking - Economic Development



Scenario B had an overall more positive ranking than Scenario A of:

168%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

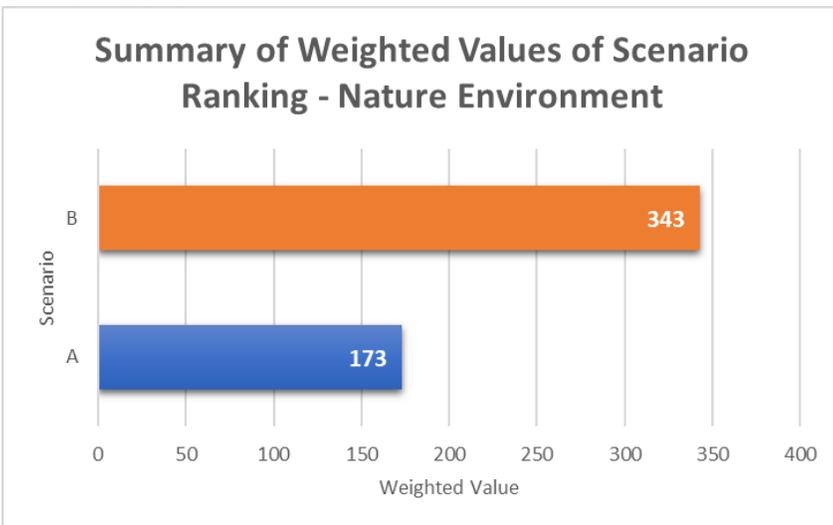


Scenario B had an overall more positive ranking than Scenario A of:

227%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

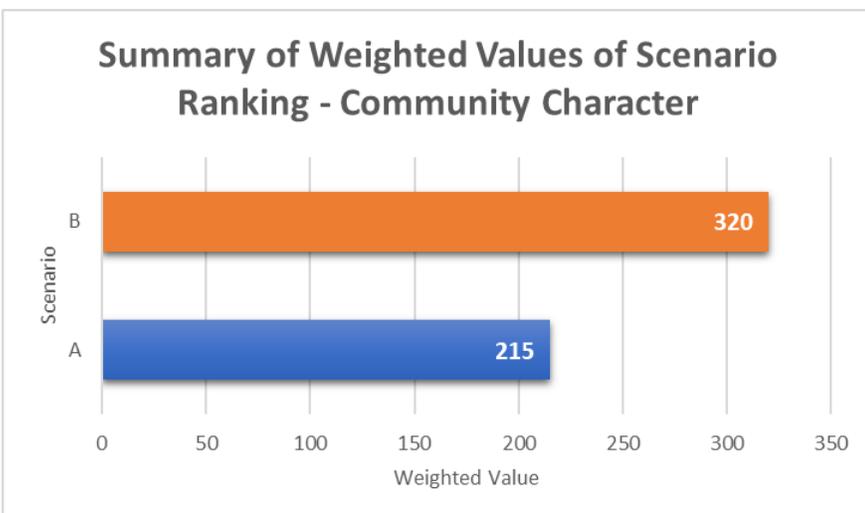
3. Numbers



Scenario B had an overall more positive ranking than Scenario A of:

198%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

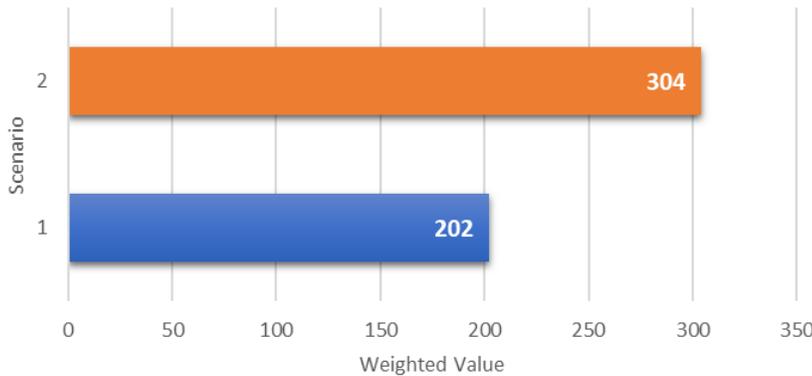


Scenario B had an overall more positive ranking than Scenario A of:

149%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Summary of Weighted Values of Scenario Ranking - Affordable Housing

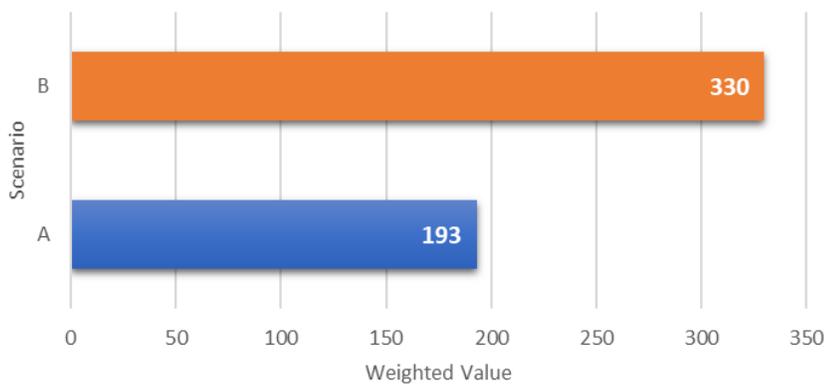


Scenario B had an overall more positive ranking than Scenario A of:

150%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Summary of Weighted Values of Scenario Ranking - Economic Development

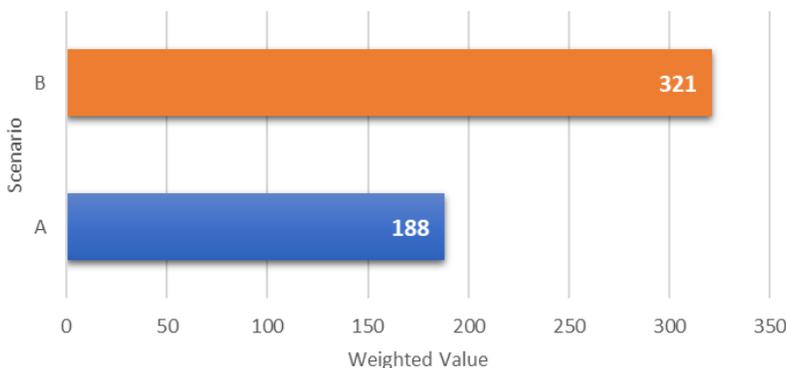


Scenario B had an overall more positive ranking than Scenario A of:

171%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Summary of Weighted Values of Scenario Ranking - Quality of Life



Scenario B had an overall more positive ranking than Scenario A of:

171%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Preferred Scenario Policy Themes

Based on the overall summary of public input and testing results from the various sources mentioned above, a number of potential policy implications have emerged that can be used to shape the policy development of the new Comprehensive Plan based on a Preferred Scenario Framework. These are arranged below according to the five public input themes that were identified throughout the public input process:

1. Nature & Environment

Sample of public input and scenario testing results:

- In the 2019 Citizen Survey, 85% of respondents felt that protecting the environment was important, while only 70% of respondents were satisfied with how the County has been doing on this issue.
- In the 2019 Summit on the Future, public input responses showed that 86% of respondents believed that it was “very important” for the County to do more to improve our efforts to protect and preserve our natural environment in the County.
- The scenario testing results showed that the pattern of land use and growth achieved in Scenario B (Alternative) allowed for better environmental impacts over Scenario A (Trend), including less total impervious land area and less developed land in proximity to environmentally sensitive areas in the County .
- The transportation testing results showed that the impacts of traffic in Scenario B (Alternative) allowed for less overall miles traveled and less carbon dioxide emissions than Scenario A (Trend).
- The public input results from the 2020 Alternative Futures Questionnaire showed that – for Nature & Environment – Scenario B (Alternative) had a 192% more positive response in the ranking than Scenario A (Trend) in the “Images” questions; and a 198% more positive response in the ranking than Scenario A (Trend) in the “Numbers” questions. Thus, there was considerable support for the protection of Nature & Environment aspects of Scenario B.

Potential implications for policy development:

- Pursuing a more compact and less dispersed pattern of new development for the County’s future is an important way to mitigate impacts to sensitive environmental areas and preserve the natural environment that is very important to County residents.
- Limiting new growth in the Rural Lands and directing it to the PSA will ensure that there will always be a reserve of rural land area that contains some of the County’s most important natural areas and productive farmland that is protected from conversion to development (in addition to the potential to maintain currently active farmland inside the PSA).
- Encouraging a larger proportion of new development to be in compact mixed use communities with a mixture of densities, versus single use, low density residential subdivisions, can help protect sensitive environmental areas through a smaller relative “footprint” of impervious surface for new growth.
- Even though a significant proportion of the County is already built out, directing new growth into more compact and mixed use development patterns – as well as on redeveloped land - can both reduce the traffic and improve the air quality than if growth is allowed to continue in a more dispersed pattern according to current trends.

How this could look:

Environment

Since most new development is on smaller lots or attached or multifamily homes, there are more protected natural areas and more land for farming and forestry uses.



Environment

More natural areas have been preserved and there are more areas of open, undeveloped land in both the PSA and the Rural Lands.



2. Community Character

Sample of public input and scenario testing results:

- In the 2019 Citizen Survey, 85% of respondents felt that preserving rural character was important, while only 69% of respondents were satisfied with how the County has been doing on this issue.
- The 2019 Citizen Survey showed that 81% of respondents felt that the number of lots for rural property should be reduced, that 77% of respondents believed that property development rights in rural areas should be purchased to reduce development potential, and that 71% of respondents believed that there should be a greater mix of offices, stores and restaurants with residential areas.
- The scenario testing results showed that the pattern of land use and growth achieved in Scenario B (Alternative) yielded significantly higher residential densities over Scenario A (Trend). However, Scenario B also yielded less impervious area over previously vacant land, as well as more developed land in proximity to scenic and historic resources
- The transportation testing results showed that there were significant improvements in level of service by roadway type and in travel times by purpose in Scenario B (Alternative) over Scenario A (Trend).
- The public input results from the 2020 Alternative Futures Questionnaire showed that – for Community Character – Scenario B (Alternative) had a 173% more positive response in the ranking than Scenario A (Trend) in the “Images” questions; and a 149% more positive response in the ranking than Scenario A (Trend) in the “Numbers” questions. Thus, there was considerable support for the preservation of Community Character aspects of Scenario B.

Potential implications for policy development:

- One of the most strongly supported policy directions shown by the public input received is towards the preservation of the rural character and the rural areas of the County and there should be strong support for implementing standards, controls and measures that would help preserve that character.
- Directing new growth into the PSA and away from Rural Lands will help maintain the valued rural character preferred in the public input received.
- The higher localized residential densities implied by patterns of development in Scenario B can contribute to preserving rural character by consuming less vacant land, but higher density development must be carefully designed to maintain high design quality and sensitivity to surrounding community context.
- Reducing the amount of development in the Rural Lands and concentrating new growth in the PSA in more compact and mixed use patterns can also improve the travel experience for future residents by reducing travel times and congestion levels Countywide.

How this could look:

Community Character

Mixed-use walkable communities with a mixture of housing types.
Protected open space and shopping areas located within close walking distance.



Community Character

A range of single-family detached, attached, and multifamily houses. Development located as infill in already developed areas more than on vacant land.



3. Affordable Housing

Sample of public input and scenario testing results:

- In the 2019 Citizen Survey, the issue of affordable housing received the highest “satisfaction gap” from respondents in terms of the difference between importance and satisfaction for this issue. In the survey, 83% of respondents felt that preserving affordable housing was important, while only 50% expressed satisfaction with how the County has been doing on this issue.
- The 2019 Citizen Survey also showed that 79% of respondents felt that there should be a greater variety and mix of housing types and prices in the County.
- In the 2019 Summit on the Future, public input responses showed that 84% of respondents believed that it was “very important” or “somewhat important” for the County to do more to provide housing opportunities that are affordable to our workforce.
- A County study on housing affordability cited in the Toward 2035 Comprehensive Plan found that 19% of County residents were severely cost burdened (paid more than 50% of their income on housing) and that an additional 17% of residents were moderately cost burdened (paid between 30% and 50% of their income on housing).
- Data from the Recommendations of the Workforce Housing Task Force in the County also showed that there is a significant deficit of housing affordable to lower-income workers (i.e., below 50% of AMI) in James City County.
- The scenario testing results showed that Scenario B (Alternative) had significantly more opportunities to provide affordable housing types than Scenario A. While housing costs and income projections for 2045 were not available for modeling, the land use model showed that there was a much higher proportion of the population in housing types that could accommodate affordable housing, such as attached and multifamily housing, as well as more diversity of housing types overall than Scenario A.
- The land use testing results also showed that there was more housing within ¼ mile of bus and walking networks than Scenario A.
- The public input results from the 2020 Alternative Futures Questionnaire showed that – for Affordable Housing – Scenario B (Alternative) had a 146% more positive response in the ranking than Scenario A (Trend) in the “Images” questions; and a 150% more positive response in the ranking than Scenario A (Trend) in the “Numbers” questions. Thus, there was considerable support for the Affordable Housing aspects of Scenario B.

Potential implications for policy development:

- While the County can do little to directly affect regional housing market dynamics, it can pursue policies that encourage the building of a diversity of housing types that are more affordable and available to a wider range of income groups.
- Through allowing housing types that include higher density housing that is close to employment, amenities and multimodal transportation options, the County can potentially stimulate more building of affordable housing types in the future. However, more diversity of housing types does not necessarily mean an increase in housing affordability, absent additional policies to stimulate housing affordability.
- By encouraging more mixed use place types, as modeled in the Alternate Scenario, the County can ensure greater likelihood for mixed housing types to be built in the future. In addition, it can ensure that affordable housing in these communities is accessible to local employment opportunities, services and civic amenities as part of a “complete community” (see below).

How this could look:

Affordable Housing

Most development is in a range of housing types including single family homes, town homes, and multifamily homes. These types of housing allow for a wider range of price points and include more options for affordable housing.



4. Economic Development

Sample of public input and scenario testing results:

- In the 2019 Citizen Survey, 88% of respondents felt that attracting more jobs and businesses was important, while only 68% of respondents were satisfied with how the County has been doing on this issue.
- The 2019 Citizen Survey also showed that 71% of respondents felt that there should be a greater mix of offices, stores and restaurants with residential areas.
- In the 2019 Summit on the Future, public input responses showed that 88% of respondents believed that it was “very important” or “somewhat important” for the County to do more to expand the local economy by attracting higher paying jobs.
- The regional growth projections for James City County for 2045 (from the Hampton Roads Regional Planning District Commission) forecast that the County will grow by 165% in population but only 115% in employment, creating a potential imbalance in the jobs to housing ratio in the future.
- The scenario testing results showed that the pattern of land use and growth achieved in Scenario A (Trend) yielded a higher net fiscal return in 25 years than Scenario B (\$24 million positive fiscal balance for Scenario A versus \$18 million positive fiscal balance for Scenario B). However, both scenarios had a net positive fiscal balance over 25 years.
- The testing results also showed that Scenario B (Alternative) had a much higher density of employment on parcels than Scenario A, as well as a significantly higher proportion of jobs in mixed use place types than Scenario A.
- The public input results from the 2020 Alternative Futures Questionnaire showed that – for Economic Development – Scenario B (Alternative) had a 168% more positive response in the ranking than Scenario A (Trend) in the “Images” questions; and a 171% more positive response in the ranking than Scenario A (Trend) in the “Numbers” questions. Thus, there was considerable support for the Economic Development aspects of Scenario B.

Potential implications for policy development:

- The County can encourage more diversity of employment that includes higher paying jobs by encouraging the development of mixed use “complete communities” that mix employment, housing and attractive community amenities in a compact walkable and accessible setting.
- Studies have shown that employers in higher wage categories (e.g. knowledge and information-based industries) prefer locations with higher density mixed use and amenity-rich communities that are favored by their highly educated workforces. To attract these types of employers, the County can pursue policies that encourage the building of these kinds of active and lively town and village centers that have sufficient density of jobs, people and amenities to attract high quality and high wage businesses.
- Since the scenario testing results showed somewhat greater net positive fiscal impact for Scenario A than for Scenario B, it is important to still allow traditional large-lot single family dwelling types in future growth to ensure a balance of housing types, income groups and promote good fiscal balance in future development for the County.

How this could look:

Economic Development

A wide range of mixed commercial uses provides for local shopping/service needs as well as a more diverse set of employment options. These could include new office and technology jobs in addition to existing retail and tourism jobs.



5. Quality of Life

Sample of public input and scenario testing results:

- In the 2019 Summit on the Future, people were asked “Which of these contributes the most to create James City County’s great community character?” The highest rated responses were “Natural Network of Greenery and Waterways” at 49% and “People Making up the Community” at 16%.
- Input received in the 2019 Summit on the Future also called for additional bike/ped/transit improvements and “connecting the places people want to go” among other comments about the value of active transportation options and connectivity.
- In the 2019 Citizen Survey, 98% of respondents felt that developers and builders should provide public amenities in communities, that 80% of respondents felt that it was important to “develop an interconnected street system to avoid traffic,” and 78% of respondents felt that farmland was “more important” than development.
- The 2019 Citizen Survey also showed that 70% of respondents felt that there should be a greater mix of offices, stores and restaurants with residential areas.
- The scenario testing results showed that the pattern of land use and growth achieved in Scenario B (Alternative) led to population being closer to bus or walking networks and much higher potential for walk access to future school sites. However, both scenarios had relatively equal access to existing schools and existing parks.
- The public input results from the 2020 Alternative Futures Questionnaire showed that – for Quality of Life – Scenario B (Alternative) had a 227% more positive response in the ranking than Scenario A (Trend) in the “Images” questions; and a 171% more positive response in the ranking than Scenario A (Trend) in the “Numbers” questions. Thus, there was considerable support for the Quality of Life aspects of Scenario B.

Potential implications for policy development:

- Based on citizen input, a strong component of quality of life in James City County is the preservation of both natural areas and of rural areas and the rural landscape. To address this, the County could take strong measures to reduce the amount of development in the Rural Lands and concentrate new growth in the PSA.
- In addition, the significant citizen reaction to the importance of farmland over development may suggest consideration of reducing some portions of the PSA areas on land that is currently vacant or significantly increase the purchase of development rights in order to increase the amount of Rural Lands in the future.
- Promoting more mixed use development and small, compact walkable communities can contribute to high quality of life features such as opportunities for active transportation and easy access to shopping, restaurants and services within new communities.
- Traffic congestion and time spent in traffic can be detriments to quality of life and the opportunity for concentrating new growth in the PSA in more compact and mixed use patterns can improve the travel experience for future residents by reducing travel times and congestion levels Countywide.
- Strong support for more bike and walking trails and greater Countywide connectivity suggests both a renewed focus on constructing more active transportation options (i.e. bicycle and pedestrian options) in the County, as well as more street connectivity and fewer dead-end cul-de-sac street patterns in new development.
- In addition to maintaining the highly valued major parks in the County, more pocket parks and community-focused parkland can be encouraged as elements of walkable neighborhood centers and gathering places.

How this could look:

Quality of Life

A larger number of smaller parks and public amenities centered around communities in biking/walking distance.



Quality of Life

Relatively high bike/pedestrian and transit access to community amenities and destinations with improved trails, sidewalks and bike facilities in the County.



PART 2. PREFERRED SCENARIO FRAMEWORK MAP

Preferred Scenario Framework Concept

The public input received and the policy implications that have been proposed can be seen to paint a new picture of what James City County could look like in the future. The result of both the scenario testing and the weight of public input received to date suggest that the County in 2045 should not be a continuation of present-day trends and patterns of development.

Shown on the following page is Preferred Scenario Framework Map that embodies some potential land use concepts from the above policy implications to help flesh out the Preferred Scenario Framework in spatial terms. It was based on the land use aspects of Scenario B in the scenario testing and reflects Place Type elements that are contained in Scenario B (Alternative).

This map is highly conceptual and is not intended to propose site-specific parcel recommendations, even though it may look like development is proposed on a given site. Instead, the colored place type designations on the map should be taken as general concepts for the types of growth that could be encouraged as an overall pattern of future growth to help visualize the Preferred Scenario Framework in terms of the County’s future growth. The intent of this map, as with the intent of the overall Preferred Scenario Framework, is that it be reviewed by the public and County policy and decision makers as an overall concept and to see how well it lines up with their vision for the County’s future land use and growth. Based on that review, specific elements of this Preferred Scenario Framework Map could be incorporated into the Comprehensive Plan through revisions to stated policies, land use descriptions, or Goals, Strategies and Actions (GSA's). These elements could also support future changes of Land Use Designations for certain areas within the County.

The notes and the Legend of the Preferred Scenario Framework Type Map are reproduced below:

Preferred Scenario Framework Map

Note that this Preferred Scenario Framework presents a hypothetical vision of the County in 2045 with conditions described as they could possibly be 25 years from today. It is not a specific proposal for the future land uses in the Comprehensive Plan and is intended only to inform potential refinements to the policy framework for the Comprehensive Plan update. The locations of Place Types shown represent just one possible pattern of growth to express a vision for the future, based on Scenario B (Alternative) in the scenario testing phase of this project but should not be taken as the only pattern that could express this vision.

Relationship to Current Comprehensive Plan and Zoning Map:

This framework map is a snapshot of one possible pattern of growth by the year 2045. It does not presume how this pattern of growth would be achieved and therefore does not necessarily conform to current zoning or the Future Land Use Map in the current County Comprehensive Plan. It is assumed that over the course of 25 years, the Future Land Use Map and some zoning designations may be changed over time. The current inventory of approved “by right” lots and subdivisions was not taken into account in this concept as these entitlements could theoretically be revised to address changing market conditions at some point, and the purpose of this concept was not to document current entitlements on parcels but to envision a different potential future based on the Scenario narrative.

LEGEND

- 

Rural Lands - A combination of several types of rural uses, including Rural Residential, Agriculture, Vacant place types. These areas are intended to help protect and enhance the viability of agricultural and forestal resources as important components of the local economy and have a vibrant rural economy deriving from uses such as wineries, horse farms, agritourism and value added farm and forestry industries.
- 

Green Infrastructure - A network of sensitive environmental areas and other areas that are not buildable that should be preserved as a network of green spaces and natural areas as long term natural resources of the County.
- 

Mixed Use - A combination of two types of mixed use; Mixed Commercial/Industrial and Mixed Residential/Commercial place types. These place types should absorb the majority of new growth in the County. They are envisioned as “complete communities” that carry a range of compact business and housing development designed with close walkable access to community spaces, amenities, shops and services.
- 

Low Density Residential - Limited areas of single family residential communities that are not integrated within mixed use communities. These communities should be located close to existing services and amenities to minimize the need for long distance auto travel for daily needs.
- 

Medium/High Density Residential - Limited areas of medium to high density residential in a combination of attached or multifamily housing communities. These communities should be located as close as possible to transit and bicycle/pedestrian networks, as well as existing services and amenities to minimize the need for long distance auto travel for daily needs.
- 

Commercial - A combination of three types of commercial; Local, Neighborhood and Regional Commercial place types. These are limited areas of single-use commercial centers with primarily retail, office and service uses to serve existing residential areas and commercial needs in developments such as local or neighborhood shopping centers, office parks and regional shopping centers.
- 

Industrial - A combination of two types of industrial; Light Industrial and General Industrial place types. These are limited areas of single-use industrial development located where industry currently exists or where impacts to adjacent residential neighborhoods can be minimized. These should be developed typically as campus-style industrial parks with extensive screening and landscaping to blend in with adjacent communities.
- 

Public, Institutional and Other - A combination of several types of uses, including public areas, institutions, state, federal and military lands and utilities.
- 

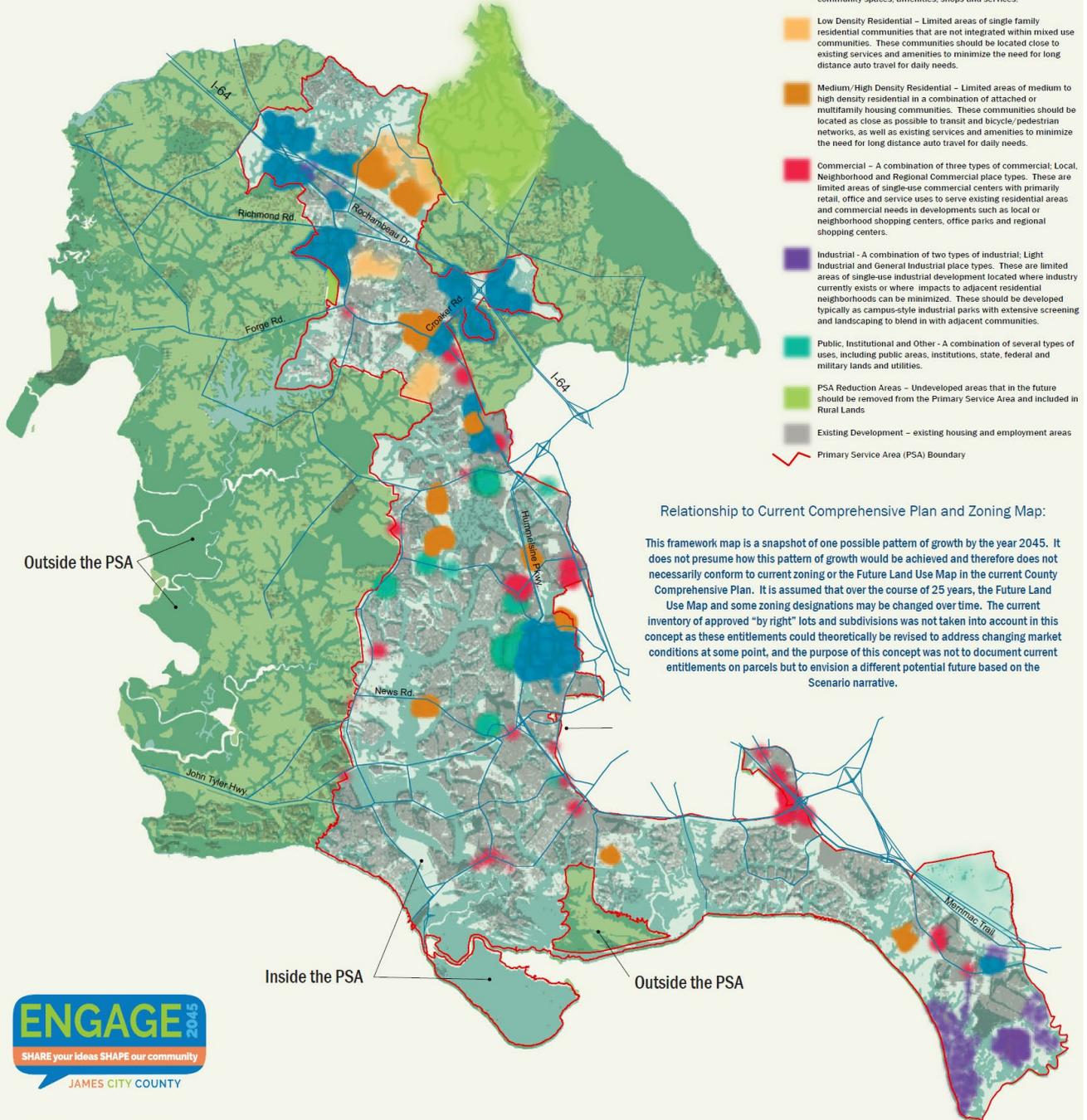
PSA Reduction Areas - Undeveloped areas that in the future should be removed from the Primary Service Area and included in Rural Lands
- 

Existing Development - existing housing and employment areas
- 

Primary Service Area (PSA) Boundary

Preferred Scenario Framework Map

Note that this Preferred Scenario Framework presents a hypothetical vision of the County in 2045 with conditions described as they could possibly be 25 years from today. It is not a specific proposal for the future land uses in the Comprehensive Plan and is intended only to inform potential refinements to the policy framework for the Comprehensive Plan update. The locations of Place Types shown represent just one possible pattern of growth to express a vision for the future, based on Scenario B (Alternative) in the scenario testing phase of this project but should not be taken as the only pattern that could express this vision.



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- **Primary Service Area (PSA) Boundary**

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Key Ideas in the Preferred Scenario Framework Map

The Preferred Scenario Framework Map embodies a number of key land use and development ideas that are based on the results of the public input to date and the overall scenario testing process. These “big ideas” are summarized in the description and in the illustration below.

Key Ideas in this map:

The overall vision and Place Type concepts in this map could be realized through a number of potential implementation policies. Following are some ideas of land use policies that could be used to encourage that future growth is guided in the direction shown in this map:

1. Limiting new residential development in Rural Lands through potential changes in utility or regulatory standards or public investments for land protection
2. Potential reductions in the PSA to maintain the rural character of some currently undeveloped areas
3. Encouraging the majority of new growth as Complete Communities by redesignating land as Mixed Residential/Commercial (e.g. some existing Low Density Residential areas) or Mixed Commercial/Industrial (e.g. the existing Economic Opportunity areas)
4. Encouraging the development affordable housing by redesignating low density areas to moderate or higher density designations that would be conducive to a mixture of housing types
5. Directing new commercial growth into mixed use areas, as part of Complete Communities by redesignating existing commercial areas and/or revising zoning to encourage mixed use in these areas

Preferred Scenario Framework Map

Note that this Preferred Scenario Framework presents a hypothetical vision of the County in 2045 with conditions described as they could possibly be 25 years from today. It is not a specific proposal for the future land uses in the Comprehensive Plan and is intended only to inform potential refinements to the policy framework for the Comprehensive Plan update. The locations of Place Types shown represent just one possible pattern of growth to express a vision for the future, based on Scenario B (Alternative) in the scenario testing phase of this project but should not be taken as the only pattern that could express this vision.

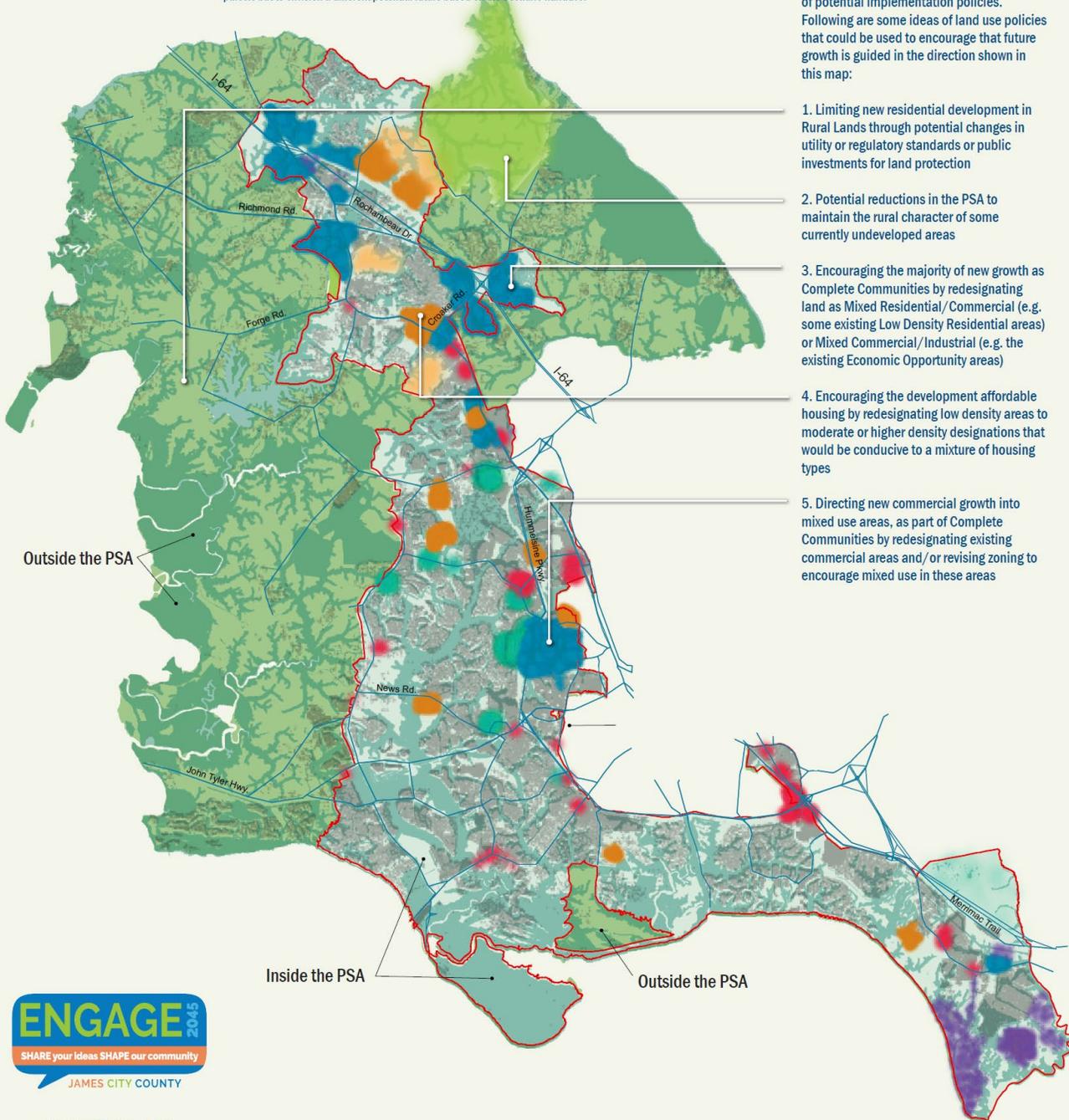
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PART 3. ADDITIONAL PLANNING CONCEPTS

Introduction

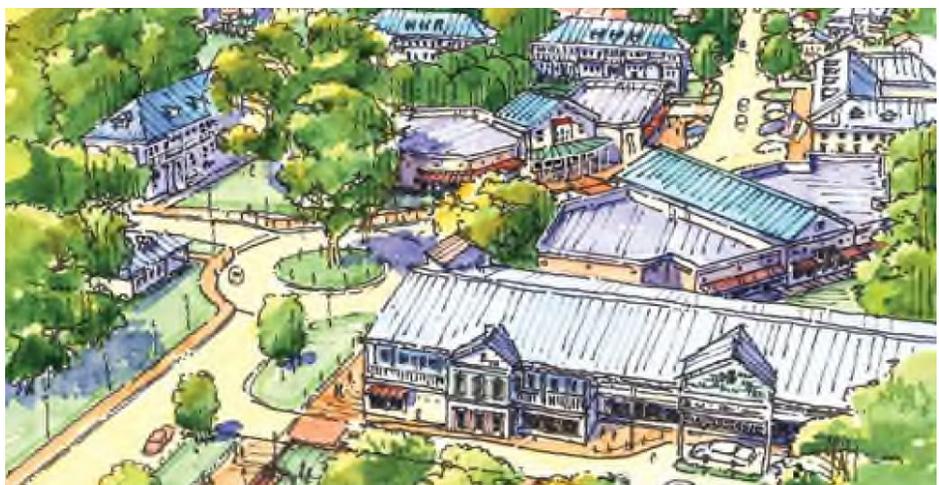
These Additional Planning Concepts represent some additional aspects of the Preferred Scenario expressed in images and descriptions of ways that some of the Policy Implications above could be realized. They are aspirational concepts that both help better define the vision represented by the Preferred Scenario and could be used to build future policies and practices for the new County Comprehensive Plan. In addition, these concepts include some findings from national, state and local surveys and research that show trends and public support for these concepts.

1. Designing with Nature

Designing with nature in mind is an approach that could help the County’s future growth and development be sensitive to the impact on the environment as a whole and the specific natural resources and scenic quality of James City County today and in the future. Design that is sensitive to the natural context considers a site’s context; including sensitive natural areas, land use and land preservation and community character and can be more economical to taxpayers in the future. By considering all of these elements, new growth can help improve the environmental health and scenic beauty of the County by:

- Preserving natural resources and open space
- Reducing sprawl and related expenditures on infrastructure and services
- Managing traffic and congestion through compact development and providing alternatives to auto travel
- Reducing air pollution through less need for driving for daily needs
- Improving the vitality of commercial and employment centers

James City County has numerous natural resources and natural landforms that make it both a distinctive and scenically beautiful environment. The preservation of such features is important, not only for the benefit they provide to air and water quality and natural habitats when they remain natural, and for their inherent or aesthetic value, but also for the economic benefit that the County derives from having a unique preservation and development pattern. The County’s general environmental protection and conservation policy is described in detail in a section of the Comprehensive Plan.

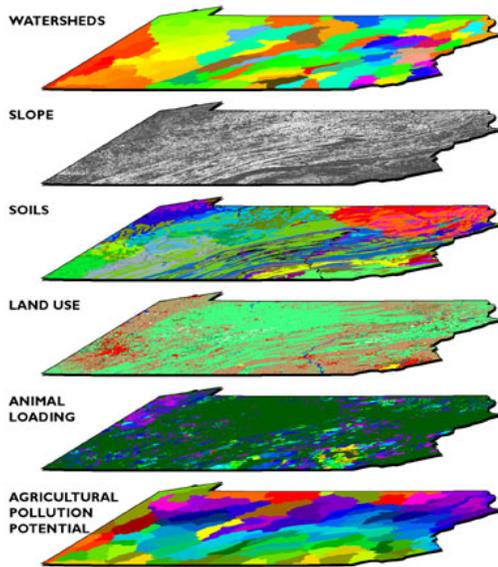


4 Designing with nature in a new community with preserved tree cover, landscaping and a compact walkable layout of mixed uses and services. Source: City of Tallahassee, FL.

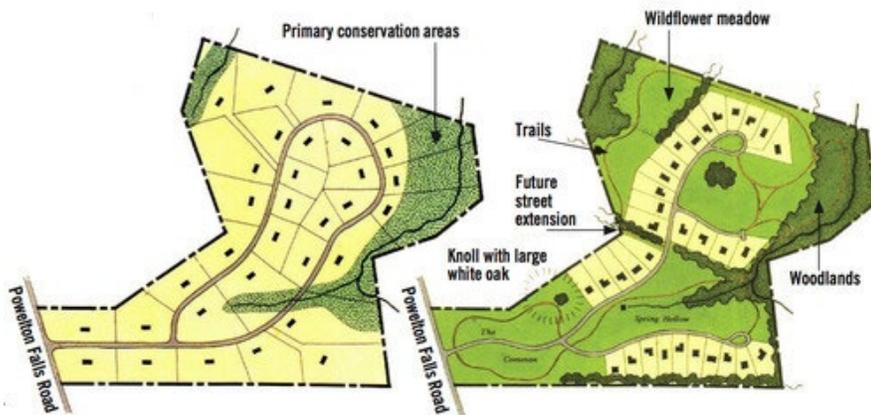
Support for Nature

Over 86% of the participants in the County’s 2019 Summit on the Future thought it was “very important” to “do more to improve our efforts to protect and preserve our natural environment in the County.” Only 2.4% thought it was “not important.”

Source: James City County staff



5 Concept of using overlay maps of environmental information to determine areas sensitive to new growth or development. Source: Penn State College of Earth and Mineral Sciences, Department of Geography



6 An example of Conservation Subdivision Design (Right) and conventional subdivision design (Left). Source: Bruce Firestone



7 An example of designing with nature - integrated stormwater harvesting systems on streets as an aspect of sustainable street design. Source: the Watershed Management Group

2. Rural Character Protection

There are many different potential ways to protect the natural resources, scenic qualities and character of rural areas. Many of these have been discussed over the years in James City County and some have been implemented. Examples of “toolkit” elements for rural character protection include:

- Use value taxation and Agricultural/Forestral districts
- Purchase of Development Rights
- Incentives or standards for lowering density (such as sliding scale zoning, conservation subdivision standards or rural large lot zoning)
- Transfer of Development Rights
- Rural Economic Development Programs
- Easement programs such as scenic easements

In any of these concepts, though, thought needs to be given to a viable means of economic return for rural landowners as alternatives to selling their land for residential development. As conventional farming faces market challenges, especially on small farms, one of the fastest growing sectors of the rural economy in the country is in specialty tourism such as:

- Agritourism
- Heritage-based tourism
- Ecotourism
- Farm experiences and events

Very often, the idea of tourism or events in rural areas causes concerns of negative impacts from large number of visitors. However, done properly and carefully managed, these kinds of rural economic development initiatives can provide good returns to landowners transitioning away or supplementing traditional farming activities through activities are small-scale, low-impact, and, in most cases, reinforce the ethic of protecting the rural character of an area.

Many of these activities require only a small farm crew in order to be successful. For instance, farm tours, bed and breakfasts, hay rides, petting zoos, and many other activities may be operated with little additional investment in labor. Examples of agri-tourism and related activities include:

- Overnight stays such as Lodging and camping facilities
- Special events and festivals such as harvest and holiday festivals
- Off the farm activities such as farmer’s markets and produce stands
- Recreation activities and events such as horseback riding and corn mazes

The Montgomery County Ag Reserve

Montgomery County, MD has one of the nation’s oldest and most successful programs for rural area protection. Some statistics on the economic value of its Ag Reserve:

- 93,000 total acres
- Number of Farms: 540
- Most farms range from 10 to 49 acres
- \$89,520 – average per farm of products sold
- Total value of agricultural products sold: \$48.3 million

Source: 2012 Census of Agriculture

The Value of Agritourism

Farm agritourism revenue more than tripled between 2002 and 2017, according to data from the Census of Agriculture. Adjusted for inflation, agritourism revenue grew from \$704 million in 2012 to almost \$950 million in 2017.

Source: USDA, 2017 Data



8 The Toano Farmer's Market is an example of an activity that can support rural economic development. Source: EPR,PC



9 Horse farms on Forge Road in James City County that can also provide income through boarding or riding activities or events. Source: EPR,PC

3. Complete Communities

The layout and design of a community can directly influence the physical, mental, and emotional health of the people who live, work, and play in them. Healthy community design through a Complete Community improves quality of life by making it easier for people to make healthy choices and live healthier lives. The land use and transportation patterns created through new development and redevelopment will influence the quality of life and health of our communities for many years.

Complete communities feature a mix of housing types to meet the needs of community members at all stages of their lives. A complete community’s housing is located convenient to daily consumer needs and open space to provide recreational opportunities, and it provides transportation options for vehicles, transit, pedestrians, and bicycles to access workplaces, shops, and services.

Increasingly, consumer preferences are recognizing these principles and new generations of people are favoring these characteristics of a Complete Community when making locational decisions:

- A mixture of employment and housing in the same community with the opportunity to live near where you work
- A mixture of age groups and housing types that accommodate people at all stages of life
- Convenient access to healthy food
- Opportunities for daily physical activity
- Shopping, services and daily needs located close to homes
- A diversity of transportation options to access workplaces and services
- Public open space, recreation and community facilities and amenities within walking/biking distance

The negative health effects of sprawling development patterns have taken decades to become evident. Instituting healthy community design is not a quick solution. It can, however, shift development patterns toward built environments that are more supportive of health and provide a foundation for current and future generations to live healthy and productive lives.

What do Americans want in their communities?

Nearly half of Americans, and three-fourths of Millennials, say they plan to move in the next five years. According to a 2015 survey by the Urban Land Institute, Americans want walkable, diverse, single-family or townhouse homes in a small town.

Source: Placemaking, Transportation Planning and the Future of Virginia’s Localities; , Virginia Office of Intermodal Planning & Investment

Important things when deciding where to live...	Important (very or somewhat)
Sidewalks and places to take walks	85%
Easy access to the highway	82%
Being within an easy walk of other places and things in the community	79%
Being within a short commute to work	76%
Having public transit nearby	64%
Bike lanes and paths nearby	57%

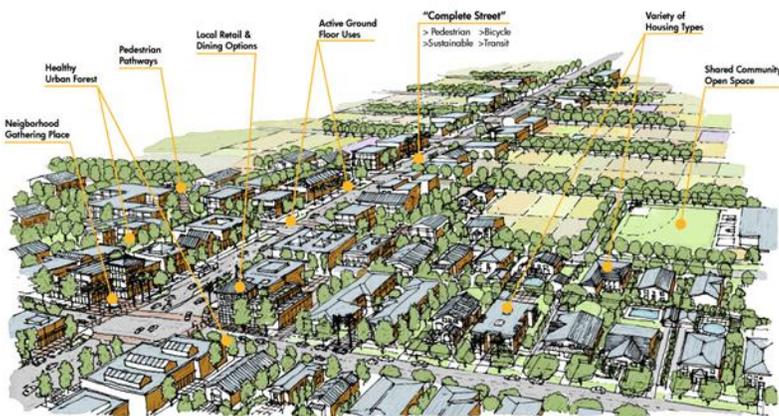
10. Survey data on key features of a Complete Community that are important in consumer locational decisions. Source: National Association of Realtors Research and Education Center at Portland State University, 2015 National Community and Transportation Preference Survey



11 Mashpee Commons, Massachusetts; a 30-year old example of a new mixed use community on Cape Cod. Source: Cape Cod Chamber of Commerce



12 New Town - James City County's mixed use community. Source: EPR, PC



13 Sketch of a Complete Community. Source: Delaware Complete Communities Toolbox

4. Housing Flexibility

Residents at various stages of life have different housing needs, requiring a diverse mix of housing types in the neighborhood. A flexible housing mix meets the changing housing needs across the lifecycle including housing for people who wish to “move up,” housing for people who wish to downsize, and housing to support all ranges of a thriving economy. In particular, planners and policy makers have identified a gap in housing types between very low density and high density types called the “Missing Middle.” These housing types, including duplexes, fourplexes, cottage courts, and courtyard buildings are underrepresented in modern development and yet are often the most traditional forms for affordable and workforce housing with a long history in the fabric of small towns and traditional neighborhoods.



14 Diagram of Missing Middle housing types. Source: Opticos Design

A key principle for providing affordable housing in the Preferred Scenario is to not segregate it into separate precincts but to include it in the context of the above-mentioned Complete Community design. In addition, other principles for flexible housing in the Preferred Scenario include the following:

- The preservation of existing housing stock, and the creation of new housing and diverse housing types to ensure that there is housing attainable for all residents.
- Housing that complements the community character in terms of mass, scale, and orientation and is seamlessly integrated into surrounding neighborhoods so that the housing functions as part of the neighborhood rather than as an isolated development;
- A diverse housing mix that meets the needs of a variety of lower, moderate, middle, and upper income households;
- Housing that is thoughtfully mixed so that housing is not segregated by type, by user, or by income;
- Housing that capitalizes on existing transit or provides the opportunity for extension of transit service; and
- Housing that provides walk and bike access to existing commercial and employment centers or provides the opportunity to create services to meet the daily needs of residents.

Most people live in detached homes (60%)... but 25% live in detached homes and would prefer an attached home in a walkable neighborhood.

Source: Placemaking, Transportation Planning and the Future of Virginia's Localities; , Virginia Office of Intermodal Planning & Investment



15 Drawing of a "Cottage Court" - an approach to adding a cluster of several affordable starter homes on a lot no bigger than one that would accommodate a typical single family home. Source: Opticos Design



16 Visualization of a new style of attached housing that is higher density than single family detached housing but maintains the character of a single family neighborhood. Source: Warwick Woods, Lancaster PA

	Lives in	Prefers	%
Mismatched	Detached home	Apartment/townhouse in walkable neighborhood	25%
	Attached home	Detached home in conventional neighborhood	13%
Matched	Attached home	Apartment/townhouse in walkable neighborhood	24%
	Detached home	Detached home in conventional neighborhood	38%

17 Survey statistics on the mismatch between the types of housing people live in and the type they prefer. Source: National Association of Realtors® and the Transportation Research and Education Center at Portland State

5. Placemaking for Economic Development

Studies have shown that the model of economic development is changing. The conventional model was traditionally to provide low taxes, roads, utilities and available land and that was considered sufficient to attract business and industry. Recent trends, however, show that site selection today is data-driven, and companies have done their homework long before reaching out to a local entity to talk specifics. The site selection process today places significant importance on what a community is doing to attract, train, retrain, and retain younger workers. Much of the battle for today’s hot new industries is based on the battle for younger workers. That’s often what drives economic development and growth. Additional research shows that millennials are more interested in living in mixed use, complete communities, whether in urban or active suburban contexts.

The suburbs are going to remain important destinations for young families, but the ideal suburban location for Millennials may not be the same as it was for previous generations. Communities that can offer the best of urban living (e.g., convenience and walkability) with the best of suburban living (e.g., good schools and more space) will thrive in the coming decade.

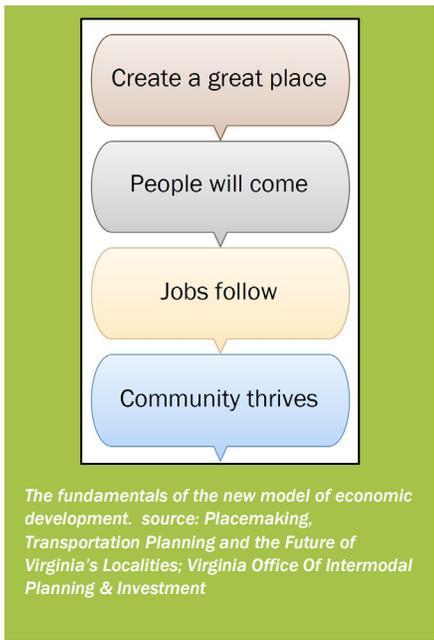
The Preferred Scenario incorporates these principles by allocating the majority of new growth – both people and jobs – into highly diverse, active mixed use centers.

How to win the future

1. **Focus on Millennials.** The battle is for younger workers. That’s what drives economic development and growth.
2. **Invest in placemaking.** Don’t ignore the basics: access, mobility, safety. But invest in ways to make your community more appealing to today’s younger workforce. You can start here:
 - o Promote “**15-minute livable communities.**”
 - o Promote the **emotional benefits** of your locality.
 - o Focus on the specific appeal of your locality’s **unique features.**
 - o Make your transportation planning messages about **convenience** and **15-minute livable communities.**
 - o Make your locality more **bikeable and walkable.**



18 The Virginia Office of Intermodal Planning & Investment's research on the new model of economic development. Source: Placemaking, Transportation Planning and the Future of Virginia’s Localities; , Virginia Office of Intermodal Planning & Investment



6. Connectivity and Transportation Choices

Complete communities typically include the ability to comfortably, conveniently, and safely walk, bike, drive, or take transit. To achieve meaningful transportation choice, Complete Communities consider transportation, land use, and community character as integrated issues, a comprehensive view that:

- Establishes a connected network of streets, sidewalks, bicycle facilities and transit facilities, meeting the economic and social needs of the community;
- Promotes community and development patterns that reduce trip lengths, emissions, and congestion;
- Provides transportation choices for people regardless of income, age, or ability;
- Provides opportunities for residents to include walking or bicycling in their daily routines.

This system is most effectively created through context-sensitive solutions, a transportation/land use/community character approach to designing and building roadways that:

- Involves and balances stakeholder needs;
- Allows flexibility in design guidelines and standards to meet the needs of users and the context of the roadway;
- Designs a transportation system and individual roads that serve all users regardless of travel mode.

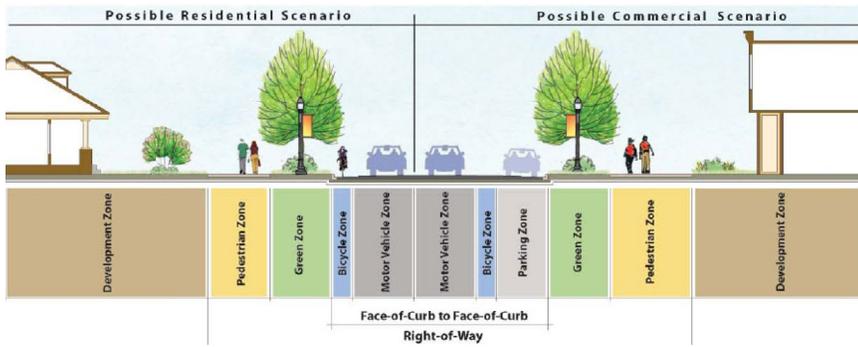
This new system of truly multimodal transportation also requires a shift in public policy, project prioritization, and spending that balances traditional approaches of road building with newer approaches to delivering transportation solutions that address travel demand management and provide funding for alternative modes of transportation, including transit, walking, and cycling.



19 An example of converting a suburban car-oriented roadway to accommodate bicycle and pedestrian facilities. Source: Morrisville, NC Town Plan

A study of home values near the Monon Trail in Indianapolis, Ind. measured the impact of the trail on property values. Given two identical houses, with the same number of square feet, bathrooms, bedrooms, and comparable garages and porches – one within a half mile of the Monon Trail and another further away – the home closer to the Monon Trail would sell for an average of 11 percent more.

Source: League of American Bicyclists



20 City of Charlotte, NC Urban Streets Design Guidelines focus on designing roadways for all users relative to different community context zones. Source: City of Charlotte, NC



21 The Virginia Capital Trail is a highly popular amenity and attraction in the County. Source: virginia.org

PART 4. APPENDICES

Appendix 1. Overview of Scenario Modeling

Introduction

The Scenario Planning process for the James City County Comprehensive Plan Update was intended to provide insight to County decisionmakers regarding long term policy choices for land use and public investment in light of potential alternative future growth scenarios.

Proposed Time Horizon and Control Totals:

As affirmed in the work sessions with staff in July 2019, the time horizon for the scenarios was determined to be 2045. The reason for this was that the existing modeling from the Hampton Roads Transportation Planning Organization for both land use and transportation uses the 2045 horizon year and this enabled the use of the data from these models as an effective benchmark for the County modeling. Starting with data from the HRTPO models not only facilitated data collection but allowed the County model outputs from the scenario process to inform regional transportation planning efforts in the future to better understand the County’s preferred future vision.

Based on using the HRTPO model datasets, their population and employment control totals for the County for the year 2045 were used as the control totals for our scenario planning effort as well. This allowed the travel demand model, in particular, to “synch” with the regional transportation modeling instead of having County modeling be isolated from the rest of the region. HRTPO’s model also uses a 2015 benchmark as the “existing” population and employment control totals for transportation planning purposes. Even though this benchmark is 5 years old, it was used in order to allow integration with the regional model - but only for transportation purposes. For land use and fiscal impact modeling, the latest population and employment data available from County datasets were used.

The control totals for population and employment used in the modeling are as follows:

	YEAR	POPULATION	EMPLOYMENT
From County parcel records →	2018	76,778	30,696
From the Hampton Roads Transportation Planning Organization Regional Model →	2045	120,741	45,921

Two scenarios were developed to present potential future growth by the year 2045 with respect to the location, density and type of development. Each alternative land use scenario was tested with the land use, travel demand model and the fiscal model to understand the impacts to economic, transportation and other performance measures under each alternative future.

The Scenario Planning process considered two scenarios as follows:

- **A “Baseline” 2045 Scenario:** It is assumed that this is based on the Regional Land Use Map that is built into HRTPO’s Travel Demand Model for 2045. The Regional Land Use map took the County comprehensive plan future land use map and translated it into a series of 21 place types that are consistent across the region. This map was vetted with County staff by the TPO and should accurately reflect the future land uses in the Toward 2035 Plan, as interpreted through the standard HRTPO place types. This was the baseline scenario and represented a “no policy change” or “business as usual” scenario for comparison with the alternative scenarios.
- **Alternative 2045 Future Scenario:** These was the alternative scenario that had a different land use pattern than the Baseline scenario. The growth control totals were the same for all scenarios, including the Baseline, but the Alternative scenario

assumed different distributions of the growth across the county through different land use patterns. This Alternative land use pattern was based on an understanding of the input received to date from the public, as well as County Board, Planning Commission Working Group and county staff. The scenario narratives and assumptions were vetted with the County Board and Planning Commission Working Group before they were tested in the modeling.

Modeling Assumptions

As the individual land use, transportation and fiscal models were developed, a series of important assumptions were established that governed how each model was set up. Below are a series of assumptions for the development of each model in building the scenarios. The Virtual Present represents the current conditions in the county for land use, transportation, and fiscal datasets. The Virtual Future is another name for the baseline or Trend scenario (Scenario A).

Part 1 Land Use Model

Place Type Geography

- The Place Types used in the scenario modeling were based on the Regional Land Use Map that is built into HRTPO's Travel Demand Model for 2045. The Regional Land Use map took the county comprehensive plan future land use map and translated it into a series of 21 place types that are consistent across the region. This map was vetted with county staff by the TPO and reflected the future land uses in the Toward 2035 Plan, as interpreted through the standard HRTPO place types.
- The land use model used James City County parcel layer for analysis (not the HRTPO parcel layer since the county layer is more detailed and up to date).
- The model assigned the HRTPO Regional Land Use Model Place Types to each of the James City County parcels using the HRTPO land use dataset.
- The HRTPO place type dataset was verified and corrected based on the county parcel dataset.

Quantifying the Development in each Place Type Polygon

- The process of quantifying how much residential density and nonresidential intensity is in each place type polygon was done in two steps:
 - The existing density/intensity for each place type polygon was assigned from county data and records.
 - The existing density/intensity in each polygon was reconciled with the socioeconomic data (jobs and people) that is built into the HRTPO Travel Demand Model.
- For the first step (Assigning the existing density/intensity to each place type from county data and records), the county GIS dataset of parcel records was used. This showed the current number of dwelling units and square footage of nonresidential building on each polygon. These were converted to a number of people and jobs (also called the socioeconomic data) in each polygon using standard industry conversion rates for dwelling units to population and nonresidential square footage to jobs.
- For the second step (to calibrate the land use data in the place types to the socioeconomic data in the TAZs), a ratio was developed and applied to the existing density/intensity in each place type polygon in order to correlate them with the TAZ control totals. The ratio, called the development factor, was applied to the polygons in the Virtual Present map to correlate the TAZ numbers for people and jobs to the place type numbers for people and jobs.
- The development factor for each polygon was derived by dividing the TAZ control total numbers by the place type numbers for jobs and for people. The development factor was then applied to the place type numbers to correlate them to the TAZ control numbers.
- The output of this calibration process was a GIS map of the Virtual Present of the county that shows the existing place types that is correlated to the existing land uses in the county and to the socioeconomic data in the regional TDM.

Part 2 Travel Demand Model

- The model is a “stand alone” model that only covers JCC and surrounding buffer area and is derived from the regional model but designed to be run separately from the regional model
- The model used year 2015 data interpolated to year 2017 as current conditions for transportation
- The model used the existing network for 2015 conditions and the existing + committed network for 2045 conditions – both derived from the HRTPO travel model. The consultants worked with county staff to make any needed refinements to the “modeled” 2015 network.
- The existing TAZ structure in the regional model was refined as needed (in consultation with county staff) to better reflect current conditions and allow more sensitive travel demand modeling.
- The model used the transit modeling capacities that are built into the HRTPO travel model

Part 3 Fiscal Model

- The base year budget used in the model is FY2020
- Base year land use/demographic data used the most recent data available from the county and derived from the land use model. (Data included but not limited to: base year population and housing units by type; base year employment and nonresidential square footage by type; household sizes by housing unit type, student generation rates by housing unit type)
- The model was broken into four sub areas based on the need to model impacts of the scenarios and LOS metrics for different factors.
- Property values were from the most recent assessment data available by type of property and reflected values for new development.
- The model allocated the James City County portion of regional facilities (schools, library, Williamsburg and York County) as needed to determine the fiscal impact to James City County.
- The model used current levels of service (LOS) for departments/services as provided by the County.
- LOS was held constant in the analysis across all scenarios to enable a comparison of land use changes as opposed to changes to levels of service. In other words, changes in land use/patterns of growth were tested in the alternative scenarios, as opposed to changes in levels of service.

Appendix 2. Technical Documentation on the No Build Layer

12/30/19

Background

The land use model requires that a “No Build” layer be defined as a key piece of baseline information for the modeling. This is a GIS layer that summarizes all of the areas that are not in play for growth allocation in the scenarios – areas that will have no new growth allocated to them. In some cases, these areas may have existing population or development but because of physical or regulatory constraints, they were not used as areas in which to allocate any new growth.

Undevelopable vs. Constrained Layers

There are two categories of layers that could comprise the No Build layer: undevelopable and constrained layers. undevelopable layers are features that are impossible to develop from a physical or geographic standpoint or which have regulations that do not permit development, for example, water is considered undevelopable and wetlands, generally for the purpose of allocating new growth are considered as undevelopable areas. Constrained layers are features that could be developed, but where development is high risk, difficult or very expensive, for example flood zones in some jurisdictions are considered buildable but with extensive mitigation or special building techniques required. The undevelopable layers were necessarily part of the No Build layer, but there was some discretion in including the constrained layers. **Table 1** shows the proposed undevelopable layers based on available GIS data.

Table 1. Hard no build layers

Hard No Build
Conservation Easements
Purchased Development Rights Easements
Cemeteries
Water
Wetlands
Chesapeake Bay Resource Protection Areas

Constrained layers require more judgment than the undevelopable layers because they are driven by policies and construction requirements as opposed to practical realities. **Table 2** lists some potential constrained layers based on the County’s GIS data availability. Also included is the consultant team’s recommendations on which layers to include in the No Build areas. This is based on professional judgment from prior scenario planning efforts and recognizes the fact that fine distinctions between no build layers tend to be negligible in light of the small proportion of land typically in a no build layer and the ample proportion of buildable land which is usually more than is needed to allocate the control totals for growth.

Table 2. Potential Constrained layers

Constrained		
Layer	Notes	Recommendation to include in No Build
Dam Break Inundation Areas		Yes
FEMA Flood Zones	Could separate into 100-Year, 500-year, etc.	Yes
Ches. Bay Resource Management Areas		Provisional – depending on scenario

Golf Courses	Polygons cover the greens, but they all seem to be on their own parcel, which could be selected to be part of the No Build.	Yes
Parks		Yes
Agriculture and Forestal Districts		Provisional – depending on scenario
Miscellaneous Easements	Could separate into different easement types only including some in the No Build layer.	Yes
Drainage Easements		Yes
Steep Slopes	Not identified - would have to create this.	No

Implementing the No Build Layer

There are two ways of incorporating no build features in the land use model. The first method is to remove the no build features from the model geography. This option completely removes the footprint of no build areas from the analysis, essentially erasing the undevelopable land from the map. The second method entails dealing with the no build features in the suitability analysis. In the second option the no build features would serve to decrease the attractiveness of those areas for growth. They could also be set for zero attractiveness for growth and thus function the same as the undevelopable layers. The recommended approach involved using a combination of the two methods to make the No Build layer, generally with all of the undevelopable areas and some of the constrained areas completely removed from development and other constrained areas having varying levels of suitability, depending on the scenarios.

Using both methods, the modelers could remove some no build features and use others as suitability detractors to repel growth in the population and employment allocations. At the very least, the undevelopable layers should be removed using the first method. Some of the constrained layers could be removed, while others could be used as suitability detractors. For example, the 100-year flood plain could be removed completely, and the 500-year floodplain could be used as a negative suitability factor.

Appendix 3. Technical Documentation on Scenario A (Virtual Future)

5/22/20

Background

The land use modeling is using the same control total for population and employment growth and the same time horizon (2045) for both the baseline and alternative scenarios. The baseline scenario is also called the Virtual Future (VF) scenario. It follows the Scenario Narrative presented to the Planning Commission Working Group on April 6, 2020 and the Board of Supervisors on May 26, 2020.

Virtual Future Scenario Narrative

The Scenario Narrative for the Virtual Future (also called Scenario A or the Trend Scenario) as presented to the PCWG and BOS states specifically,

“Current land use trends and development patterns continue, including dispersed single-family development and retail centers. Protection of rural areas is encouraged but some level of development outside the PSA continues.”

Control Totals

The same overall countywide control totals for population and employment are being used consistently for both the VF and any alternate scenarios. These derive from the HRTPO Regional Travel Demand Model and are summarized below:

YEAR	POPULATION	EMPLOYMENT
2045	119,905	45,921

Modeling Methodology

In order to model the VF as the general continuation of present development trends to the year 2045, the following assumptions were made to construct the scenario:

1. The current composition of population and employment by place type in the Virtual Present (VP) was assumed to be carried forward to the year 2045 in the VF.
2. To do this, the Virtual Present (VP) population (pop) and employment (emp) were categorized into Place Types and a percentage of total pop/emp was calculated for each Place Type. These same percentages were then used to assign control total percentages for the VF.
3. Therefore, the same percent of pop/emp by place type was used for the VP and the VF as follows:
4. Baseline population increase of consistent 56% across all place types
5. Baseline employment increase of consistent 51% across all place types
6. In some cases, however, exceptions to this general approach were deployed as follows:
 - a. Mixed Use – Virtual Present mixed use place types only account for 3.5% of population, and 7% of jobs. The policies in the Toward 2035 Comprehensive Plan favor more mixed-use development. Therefore, control totals in the VF for mixed use were adjusted upwards:
 - b. MCR was adjusted to 6.2% for pop and MCI was adjusted to be 6.1 % for a combined total of 12.3% for pop.
 - c. MCI was adjusted to 7.0 % for emp and MCI was adjusted to be 7.2 % for a combined total of 14.2% for emp.

- d. Residential Medium Density - RMD currently accounts for 37.3% of the VP population. With the policy assumption that future development will go increasingly toward Mixed Use development, the proportion of RMD in the VF was lowered from 37.3% to 30.4%.
- e. The increase in mixed use pop was absorbed by lowering the pop in RMD. The increase in mixed use emp was absorbed by lowering the percent of emp in CR and CL (see below).
- f. Commercial Regional - The CR place type is not found in the Toward 2035 Comprehensive Plan land use map. Therefore, this place type was not grown proportionately and a share of emp for this land use was absorbed by the increased growth in Mixed Use. The VP emp percentage is 17.3% and the VF emp percentage is 11.5%
- g. Commercial Local - For CL, A small increment of 2% of emp was allocated to the MCI and MCR place types. This small amount was needed to match the 28% share for both population and employment in MU types.
- h. Minor adjustments - To balance out the proportions of all the place types to equal the overall control totals, some minor (2% or less) adjustments were made form a strict proportional growth from the VP to the VF. Place types with less than .05% proportional share of the virtual present were counted as zero for the VF.

Map Adjustments

The VF map of place types was created by merging the VP map and the Toward 2035 Comprehensive Plan (as translated into the standard place types used in this model). In general, the VP place type designations were overlaid on top of the Toward 2035 Comprehensive Plan land use designations and replaced them where there was existing development. This created a VF place type map that showed current place types for where development already exists and future place types where there is no current development.

The VP mapping was developed using county parcel data. The VF mapping was developed using the Toward 2035 Comprehensive Plan land use map. In both cases, there were a few land uses that did not exist in one dataset or the other and conversions had to be made. These conversions are as follows:

1. Small Scale Ag was in the County parcel database but is not a place type in the model. Therefore, it was translated to AA to fit within the model place types for the VP.
2. For the VF, all AA parcels were kept as AA when they were outside the PSA. However, all AA parcels outside the PSA were converted to new categories based on their Toward 2035 Comprehensive Plan designation.
3. Parcels designated as Mixed Use in the Toward 2035 Comprehensive Plan were converted to MCR in the VF.
4. Parcels designated as JCC Economic Opportunity in the Toward 2035 Comprehensive Plan were converted to MCI in the VF since Economic Opportunity recommendations in the plan support commercial/industrial as the primary uses, with residential as secondary.

Individual Parcel Adjustments

In addition to the general map adjustments above, certain individual parcels in the VF were redesignated to different place types based on approved or anticipated development plans. County staff provided guidance on these based on the status of approved plans.

Allocation Methodology

The following describes the methodology used to allocate the growth control totals to the VF scenario using the CommunityViz software.

1. In general, population and employment was allocated to the place types in the VF map up to the control totals for each place type.
2. The growth was distributed evenly across all parcels that have capacity to accommodate the growth according to the designated control totals by place type.
3. Growth was be distributed first to all parcels that are vacant. The vacant parcels was filled first. In most cases, the vacant parcels should accommodate all the growth called for in the control totals.

4. However, if there is not sufficient capacity in the vacant parcels, growth was next be allocated to the partially developed parcels. Partially developed parcels are ones that have some existing development but have additional capacity to absorb growth up to their buildout capacity.
5. The partially developed parcels were developed up to their capacity (which is documented in the Lookup tables for each place type).
6. The allocation of growth to partially developed parcels assumes a level of intensification of the existing parcel – whether that occurs through infill on small portions or through a wholesale redevelopment of the parcel to a higher intensity.
7. In order to ensure an even distribution of growth across all parcels within a given place type, the buildout percentage values for place types were adjusted within the Lookup tables. These buildout percentages are the assumed proportions of a place type that are built out and usually range from 70-90%.

By adjusting a buildout percentage for a place type, an exact amount of growth can be allocated to all parcels within a specific place type to ensure that the increment of growth is randomly (evenly) distributed across all parcels. This was done on an iterative process by the consultant team during allocation, and steps documented.

Appendix 4. Technical Documentation on Scenario B (Alternate Future)

5/27/20

Background

The land use modeling is using the same control total for population and employment growth and the same time horizon (2045) for both the baseline and alternative scenarios. The alternative scenario is also called the Alternative Future (AF) scenario as well as the Public Guidance scenario. It follows the Scenario Narrative presented to the Planning Commission Working Group on April 6, 2020 and the Board of Supervisors on May 26, 2020.

Alternate Future Scenario Narrative

The Scenario Narrative for the Alternate Future (also called Scenario B - Alternate) as presented to the PCWG and BOS states specifically,

“Greater protection for rural lands, focused on rural and agricultural uses outside of the PSA. More focus on infill, redevelopment, and economic development at higher densities in the PSA but in concert with existing community character.”

Control Totals

The same overall countywide control totals for population and employment are being used consistently for both the VF and the AF scenarios. These derive from the HRTPO Regional Travel Demand Model and are summarized below:

YEAR	POPULATION	EMPLOYMENT
2045	119,905	45,921

Modeling Methodology

In order to model the AF to be consistent with the scenario narrative to the year 2045, the following assumptions were made to construct the scenario:

7. Whereas the VF represents a straight line continuation of the growth by place type in the Virtual Present (VP) carried forward to the year 2045, the Alternate Future varies growth percentages by place type in order to better match the Scenario Narrative.
8. To do this, control totals were assigned to each place type that reflected the characteristics of the scenario narrative such as more diverse employment uses or housing types or less growth outside the PSA.
9. For growth in place types that were not addressed in the AF scenario narrative, they were generally kept at the same proportion of total growth as in the VF.
10. Specific adjustments in pop and emp proportions of growth by place types and the justifications for them are as follows:
 - a. Agriculture – a minimal amount of population and employment in the VP was held at the same proportion of growth across the VF and AF (0.2%).
 - b. Local Commercial – a proportionally smaller proportion of emp growth from the VF (23%) to the AF (17%) was assigned, consistent with the scenario narrative calling for less retail growth in 2045
 - c. Neighborhood Commercial – a very small proportion of emp growth in the VP was increased slightly from the VF (1%) to the AF (2%) to reflect more small-scale neighborhood shopping to serve walkable communities
 - d. Regional Commercial – As this place type was not found in the Toward 2035 Comprehensive Plan land use map, it was not grown proportionately in the VF and a share of emp for this land use was absorbed by the increased growth in Mixed Use. For the AF, the proportion of emp growth was kept the same as for the AF (11%), which essentially means that this place type does not grow in either the VF or the AF.
 - e. Heavy Industrial – this place type is not addressed in the AF scenario narrative. While it was assumed to continue growing in the AF, its proportion of emp growth was decreased from 21% in the VF to 15% in the AF.

- f. Light Industrial – this place type is not addressed in the AF scenario narrative. While it was assumed to continue growing in the AF, its proportion of emp growth was decreased from 9% in the VF to 8% in the AF.
- g. Public / Semi Public - this place type is not addressed in the AF scenario narrative. The proportion of emp growth was kept the same in the VF and in the AF (19%).
- h. Port/Aviation Industrial – a very small fraction of total employment, this place type is not addressed in the AF scenario narrative. The proportion of emp growth was kept the same in the VF and in the AF (0.2%).
- i. Transportation Network – no pop/emp in the VP and none assigned in the VF or AF
- j. Utilities – a very small fraction of total employment, this place type is not addressed in the AF scenario narrative. The proportion of emp growth was kept the same in the VF and in the AF (0.1%).
- k. Mixed Use Commercial / Industrial - Virtual Present mixed use place types only account for small proportions of population and jobs. For the VF, MCI was adjusted to 7% for emp and 6% for pop. As the AF calls for greater growth in mixed use place types, the MCI place type was adjusted to have double the proportion of emp growth (14%) and slightly more of the proportion of pop growth (7%) to be consistent with the scenario narrative.
- l. Mixed Use Commercial / Residential - Virtual Present mixed use place types only account for small proportions of population and jobs. For the VF, MCR was adjusted to 7% for emp and 6% for pop. As the AF calls for greater growth in mixed use place types, the MCR place type was adjusted to have more than double the proportion of pop growth (17%) and somewhat more of the proportion of emp growth (10%) to be consistent with the scenario narrative.
- m. Military - no pop/emp in the VP and none assigned in the VF or AF
- n. Resource Conservation - no pop/emp in the VP and none assigned in the VF or AF
- o. Historic / Cultural - a minimal amount of population and employment in the VP was held at roughly the same proportion of growth across the VF and AF (1-2%).
- p. Parks and Recreation - no pop/emp in the VP and none assigned in the VF or AF
- q. Low Density Residential – while low density residential is a significant proportion of the VP and VF place types (53-55%), it was significantly reduced as a proportion of total pop growth in the AF (down to 39%) to be consistent with the scenario narrative that calls for less growth in single family detached residential development.
- r. Medium Density Residential – medium density residential was a significant proportion of the VP place type pop (37%) and was reduced somewhat in the VF to account for greater mixed use growth (30%). In the AF, it was further reduced (25%) to address the scenario narrative that called for greater growth in mixed use communities and housing types that could be more affordable.
- s. High Density Residential – this place type was not present at all in the VP or the VF. However, in the AF, it was increased to be 8% of the total pop in 2045. This was done to address the scenario narrative that called for a greater range of housing types that could be more affordable.
- t. Rural Residential – the VF showed the same proportion of pop in this place type as the VP (4%). However, the AF showed a somewhat lower proportion of pop (3%) in this place type consistent with the scenario narrative that indicates less growth outside the PSA.
- u. Vacant - no pop/emp in the VP and none assigned in the VF or AF

Mapping Methodology

The approach to allocating the control totals by place type for the AF involves the use of a “guide map” to guide the modelers in spatially allocating the growth in the county. This guide map is in the form of a conceptual map showing where new growth nodes could be centered in the form of “targets” or nodes of new growth. The targets were located generally where the Towards 2035 future land use map showed as locations by place type, but were adjusted to avoid existing development or “no build” areas.

This map does not show precisely where growth will be allocated since the modeling process will dictate the precise location of growth based on parcel geography and “no build” constraints, as well as parcel capacity. However, it shows place type nodes as “targets” for the growth to be allocated.

It should be noted that the allocation process is an iterative one and the modelers used these as general target locations for growth, making adjustments based on the amount of growth that needs to be allocated and the availability of capacity in each location.

Allocation Methodology

The following describes the methodology used to allocate the growth control totals to the AF scenario using the CommunityViz software.

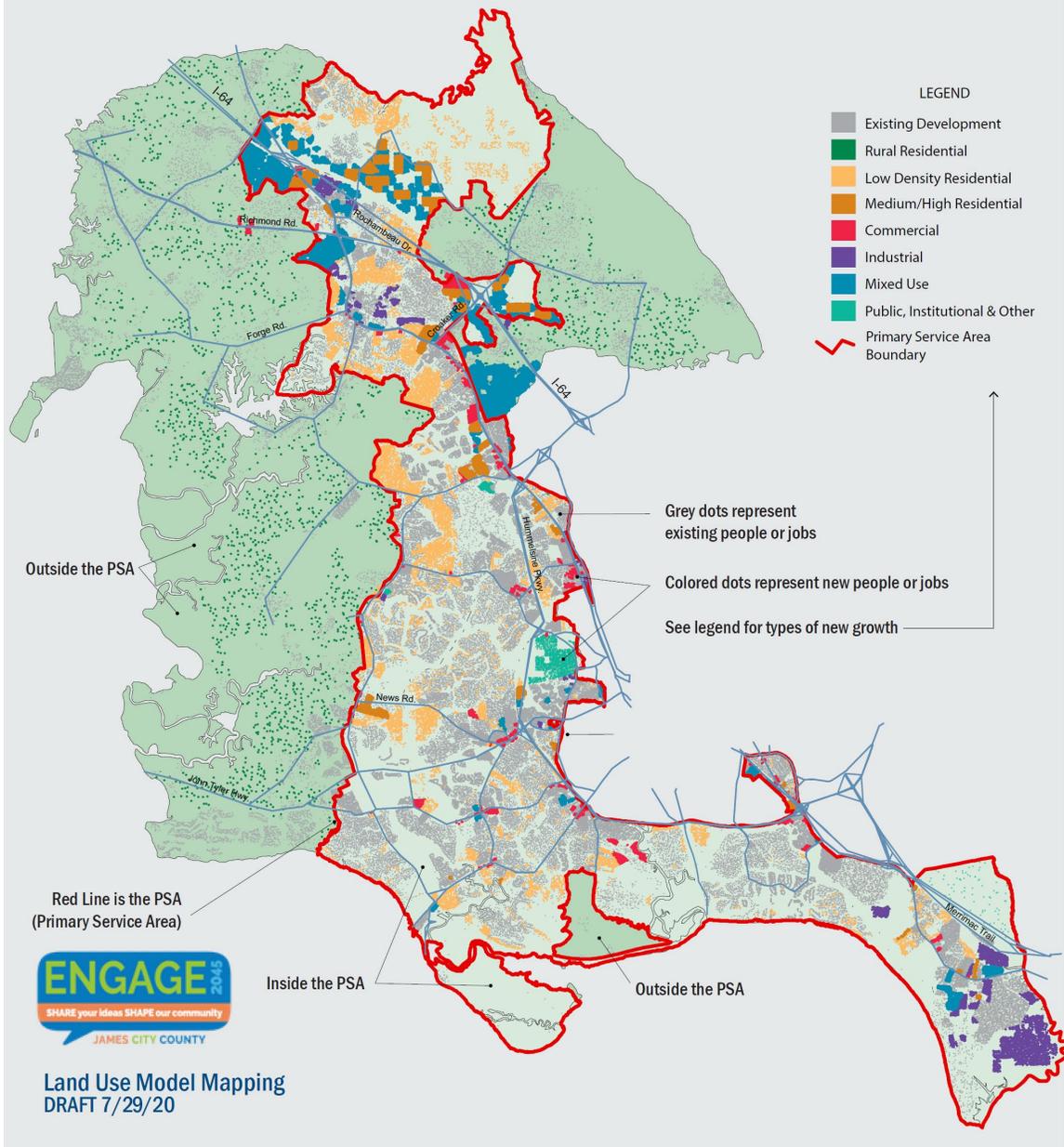
The spatial allocation process included:

1. Allocating growth to parcels with available capacity on or around the targets shown on the guide map.
2. Starting by allocating growth to vacant parcels in the vicinity of the targets shown on the guide map.
3. Once the capacity in the vacant parcels nearest to the target is used up, start allocating capacity to “partially developed” parcels nearest the targets up to the control totals for each place type.
4. Consistent with the scenario narrative direction to increase the amount of redevelopment in this scenario, a preference was given to allocating growth closest to the targets on partially developed parcels, rather than allocating to vacant parcels that are farther away from the targets.
5. The vacant and partially developed parcels were developed up to their capacity (which is documented in the Lookup tables for each place type), favoring those parcels closest to the targets.
6. The allocation of growth to partially developed parcels assumes a level of intensification of the existing parcel – whether that occurs through infill on small portions or through a wholesale redevelopment of the parcel to a higher intensity.
7. In order to ensure an appropriate density and concentration of growth around the spatial targets, the buildout percentage values for place types may be adjusted within the Lookup tables. These buildout percentages are the assumed proportions of a place type that are built out and usually range from 70-90%.
8. By adjusting a buildout percentage for a place type, an exact amount of growth can be allocated to all parcels within a specific place type to ensure that the appropriate increment of growth can be allocated to create a spatial pattern consistent with the Scenario Narrative. This was done on an iterative process by the consultant team during allocation, and steps documented.

Appendix 5. Scenario Maps

SCENARIO A. TREND

- ✓ Current land use trends and development patterns continue
- ✓ Dispersed single family development and retail centers.
- ✓ Protection of rural areas is encouraged but some level of development of Rural Lands (areas outside the Primary Service Area) continues.

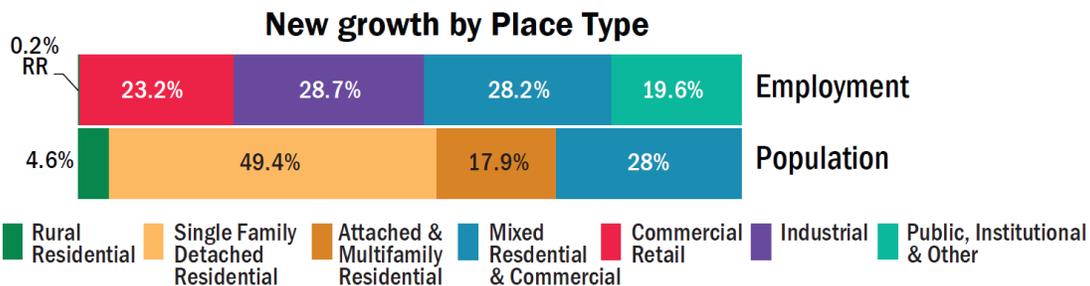


SCENARIO A. TREND

This map is a computer model of one possible way that the County could grow by the year 2045. It is based on a hypothetical amount of new people and jobs. Both Scenario A and B have the same amount of new growth (represented by the colored dots) but each scenario distributes them differently according to the chart below.

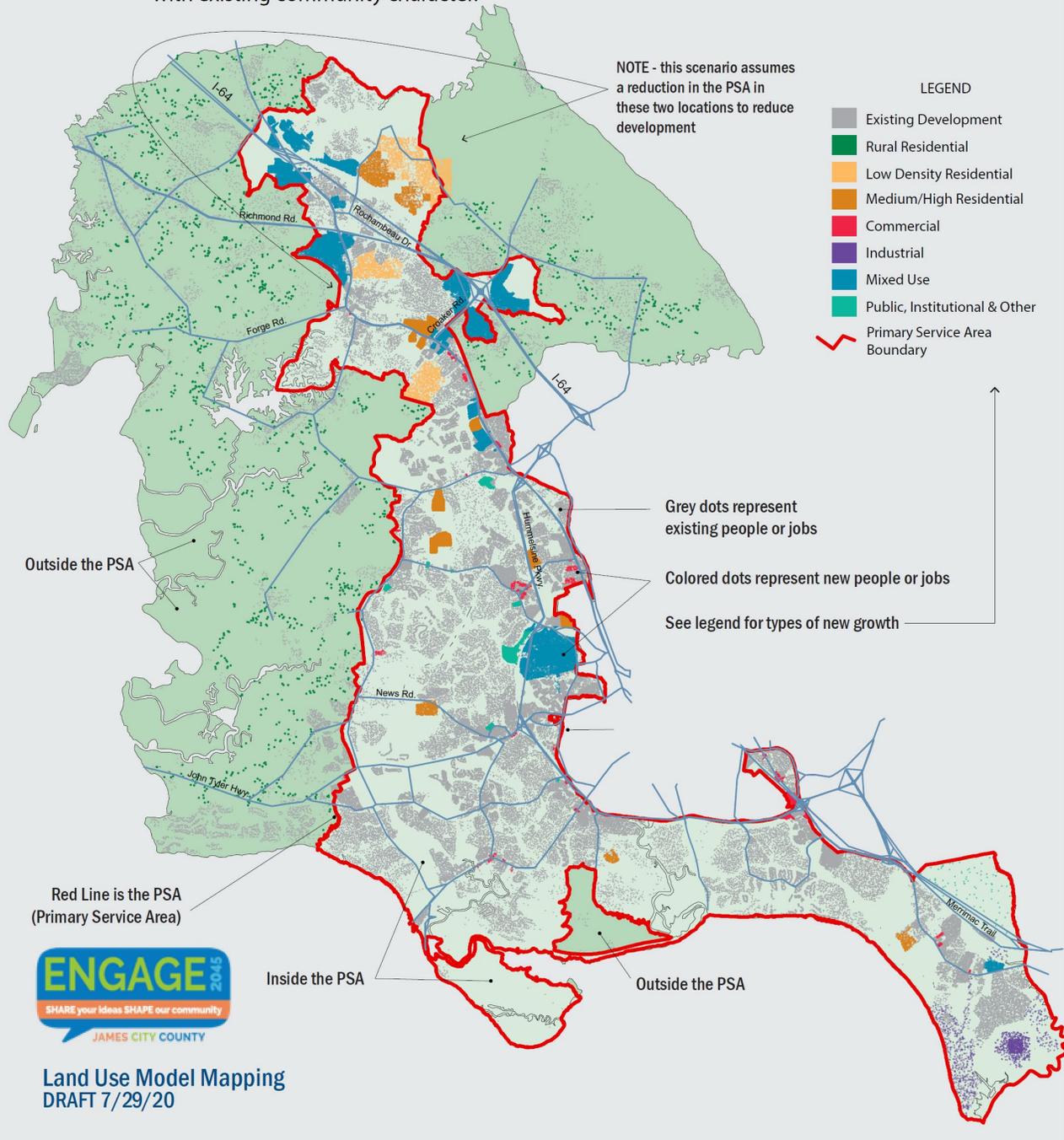
The chart below shows how many people or jobs were allocated in this scenario in different types of land uses. On the map, read the scenario description, review how growth has been distributed by the colored dots and rate how closely this scenario matches your vision for the future of the county.

Note that this growth is not a goal or a prediction - it is just a way of portraying the impacts of different patterns of growth (some of which are shown in the following pages of this questionnaire)



SCENARIO B. ALTERNATIVE

- ✓ Rural lands outside the Primary Service Area used primarily for rural and agricultural purposes instead of development
- ✓ More protections for rural lands
- ✓ More focus on infill and redevelopment
- ✓ Economic development at higher densities in the Primary Service Area but in concert with existing community character.



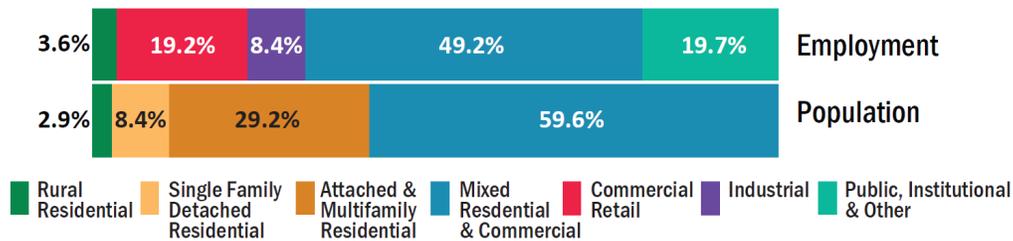
SCENARIO B. ALTERNATIVE

This map is a computer model of one possible way that the County could grow by the year 2045. It is based on a hypothetical amount of new people and jobs. Both Scenario A and B have the same amount of new growth (represented by the colored dots) but each scenario distributes them differently according to the chart below.

The chart below shows how many people or jobs were allocated in this scenario in different types of land uses. On the map, read the scenario description, review how growth has been distributed by the colored dots and rate how closely this scenario matches your vision for the future of the county.

Note that this growth is not a goal or a prediction - it is just a way of portraying the impacts of different patterns of growth (some of which are shown in the following pages of this questionnaire)

New growth by Place Type

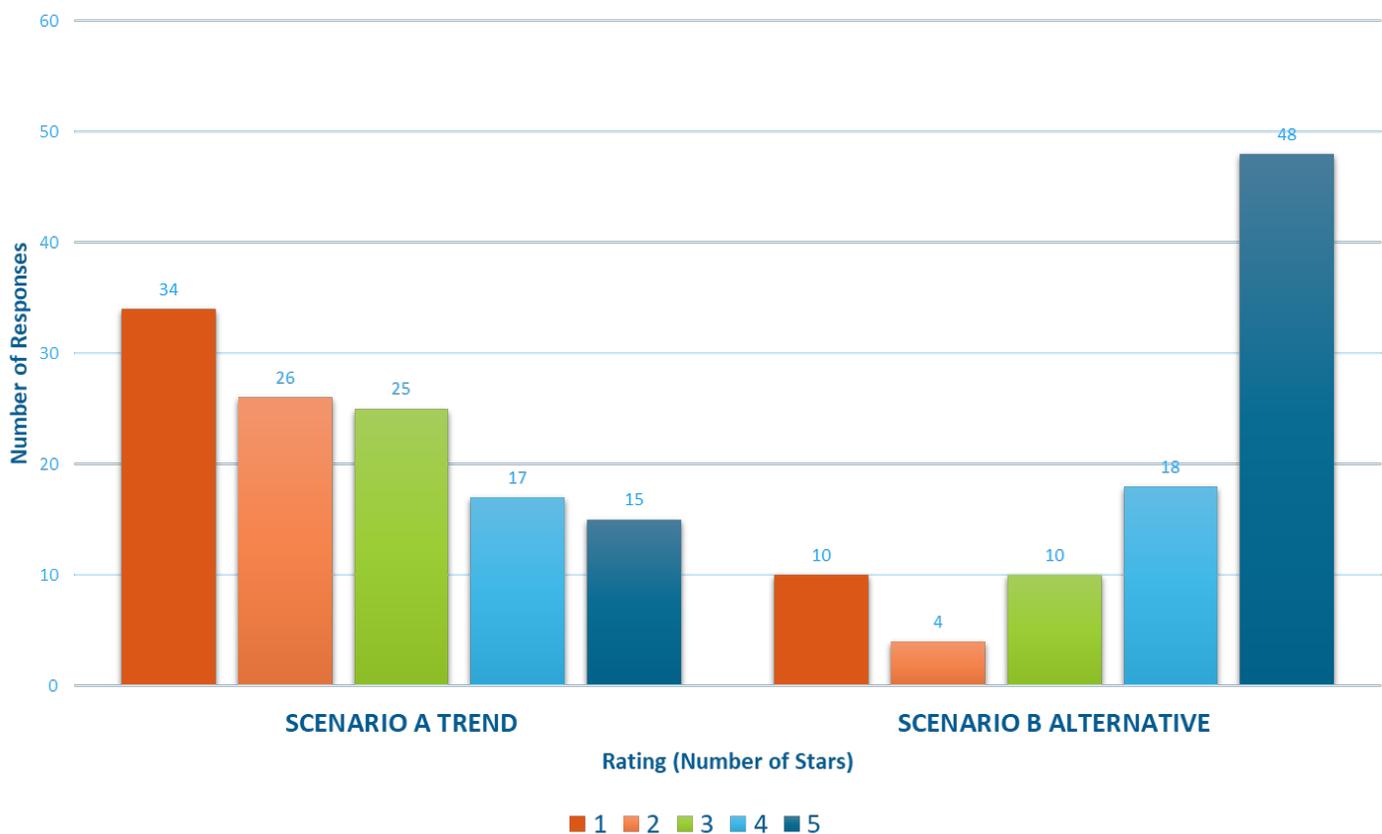


Appendix 6. Alternative Future Questionnaire Results

The Exploring our Future Alternatives Assembly, conducted on August 10, 2020 offered an online questionnaire concerning alternative future scenarios for public response that ran for three weeks until September 2nd, 2020. This questionnaire was conducted through the interactive MetroQuest platform and presented two alternative scenarios for the public to review. The results of the public input on the scenarios are summarized below. The responses in all cases were done in the form of 1 to 5 stars, with 1 star being furthest from your vision for the county for the future, to 5 stars closest to your vision for the county in the future.

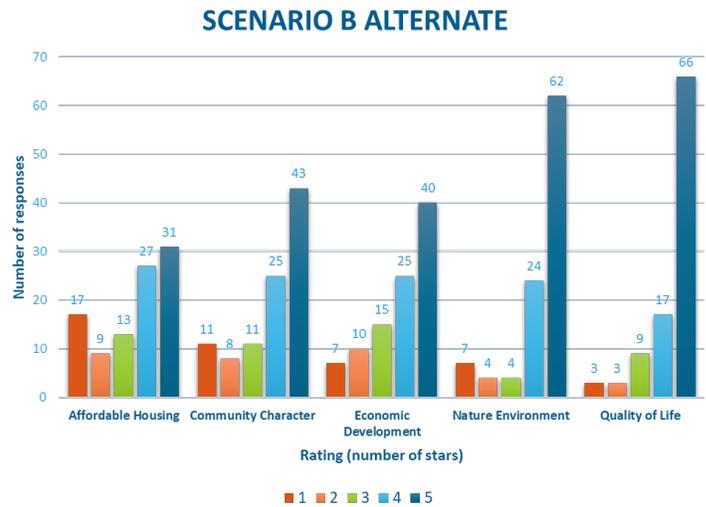
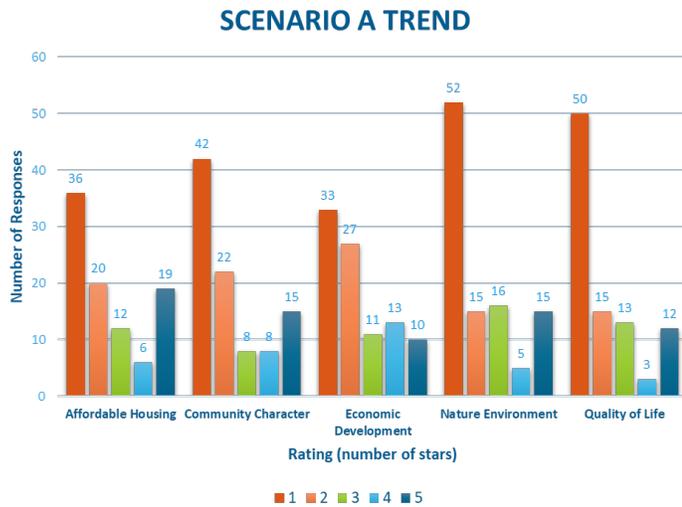
1. Maps:

After looking at the maps of each Scenario, rate each Scenario from 1-5 stars:



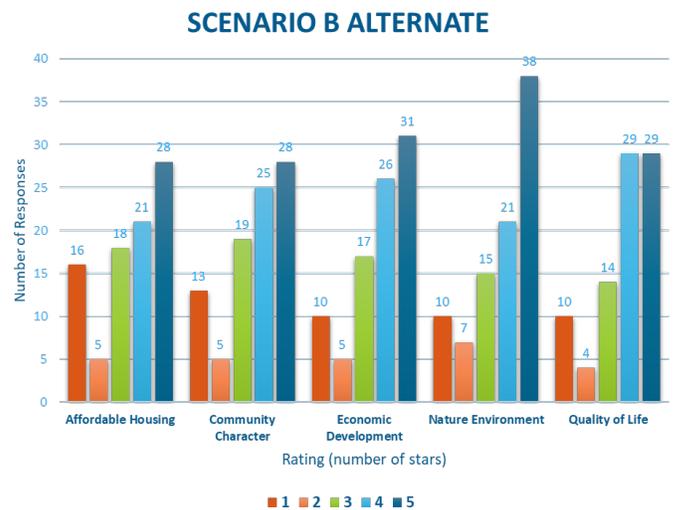
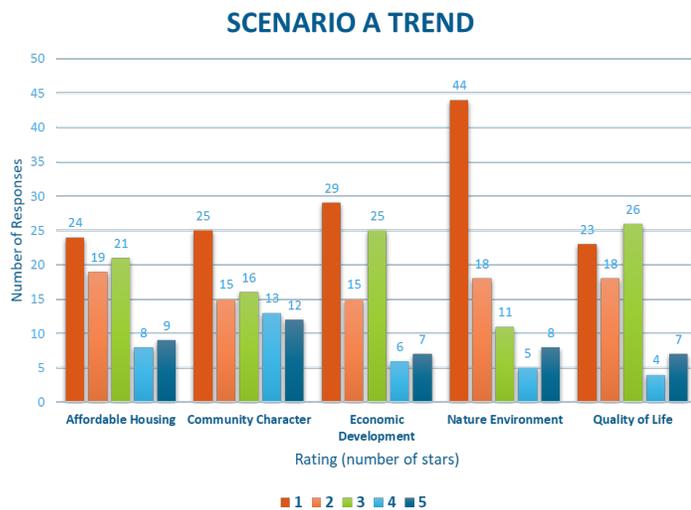
2. Images:

After looking at the images of each Scenario, rate each Scenario from 1-5 stars:



3. Numbers:

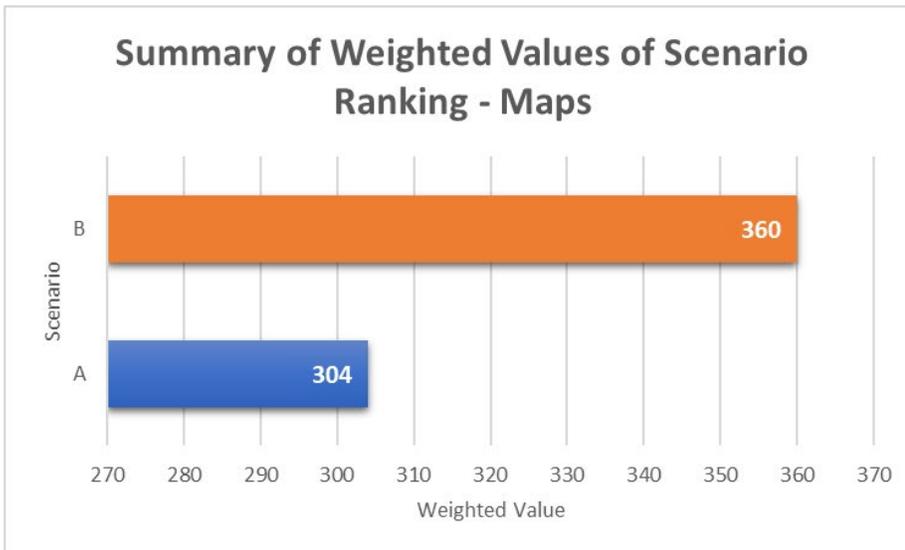
After looking at the charts of each Scenario, rate each Scenario from 1-5 stars:



Weighted Value Comparisons

In addition to the raw results shown above, the results were also compared as weighted values. For this calculation, the number of stars in responses were given a “weight” (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario’s score differed from the other. For example, Scenario B scored x% higher than Scenario A for a particular question. The results are shown below:

1. Maps

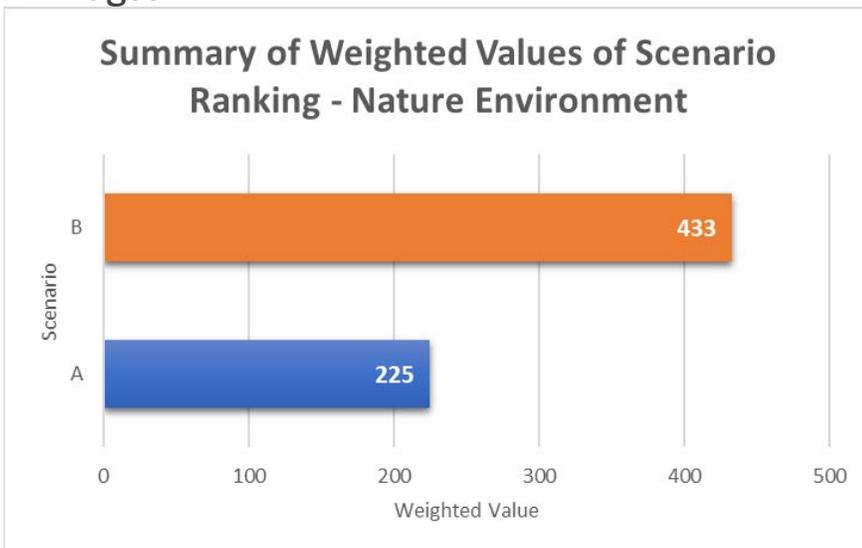


Scenario B had an overall more positive ranking than Scenario A of:

118%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

2. Images

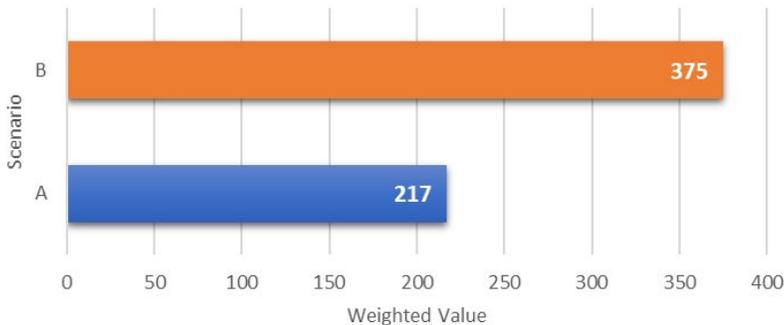


Scenario B had an overall more positive ranking than Scenario A of:

192%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

Summary of Weighted Values of Scenario Ranking - Community Character

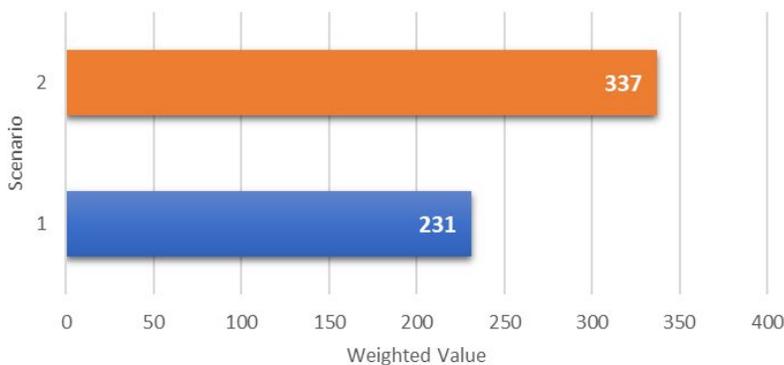


Scenario B had an overall more positive ranking than Scenario A of:

173%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Summary of Weighted Values of Scenario Ranking - Affordable Housing

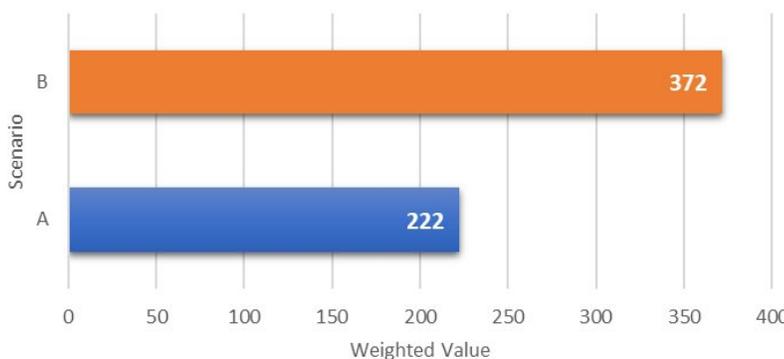


Scenario B had an overall more positive ranking than Scenario A of:

146%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Summary of Weighted Values of Scenario Ranking - Economic Development

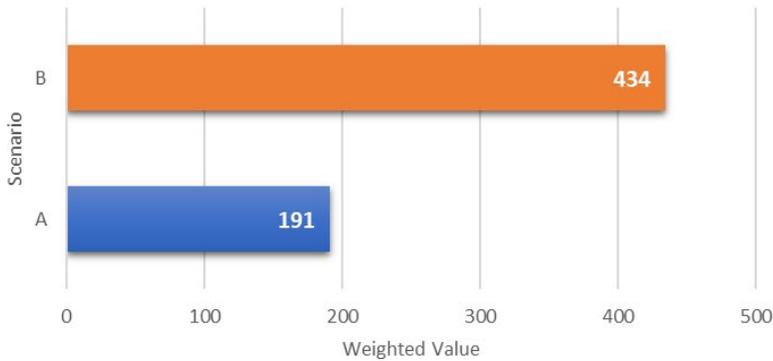


Scenario B had an overall more positive ranking than Scenario A of:

168%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Summary of Weighted Values of Scenario Ranking - Quality of Life



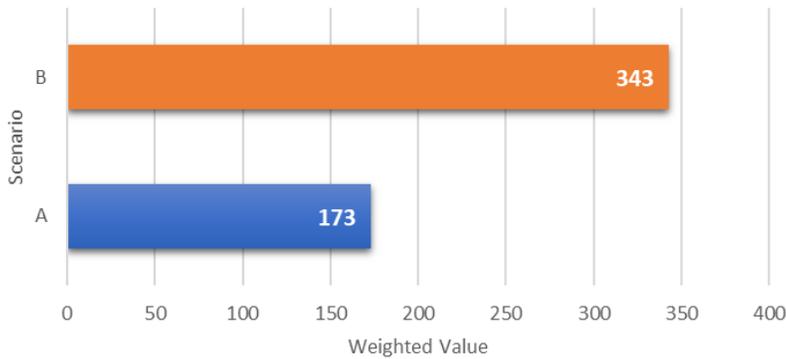
Scenario B had an overall more positive ranking than Scenario A of:

227%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

3. Numbers

Summary of Weighted Values of Scenario Ranking - Nature Environment

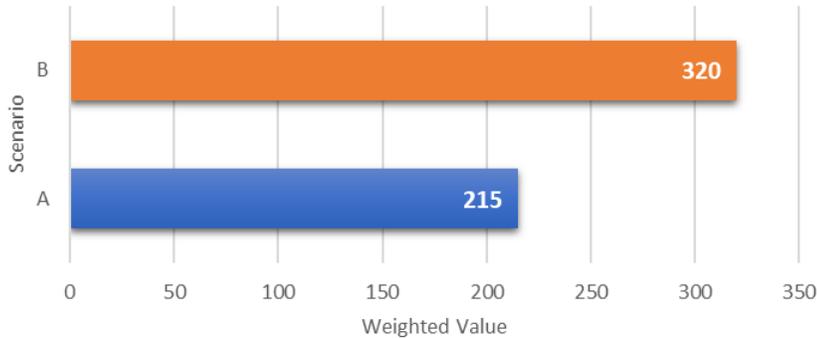


Scenario B had an overall more positive ranking than Scenario A of:

198%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.)

Summary of Weighted Values of Scenario Ranking - Community Character

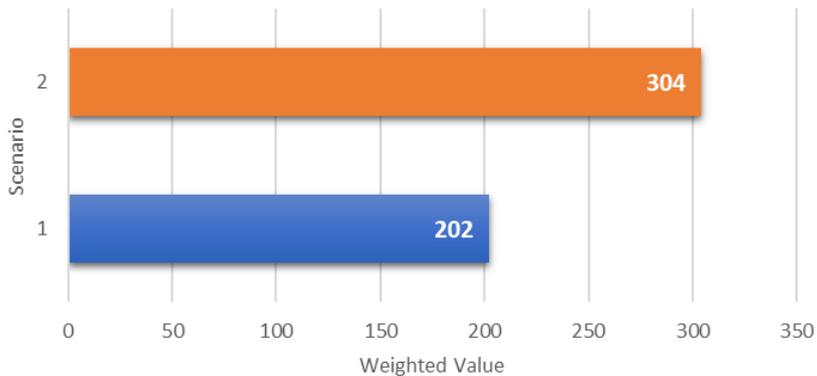


Scenario B had an overall more positive ranking than Scenario A of:

149%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

Summary of Weighted Values of Scenario Ranking - Affordable Housing

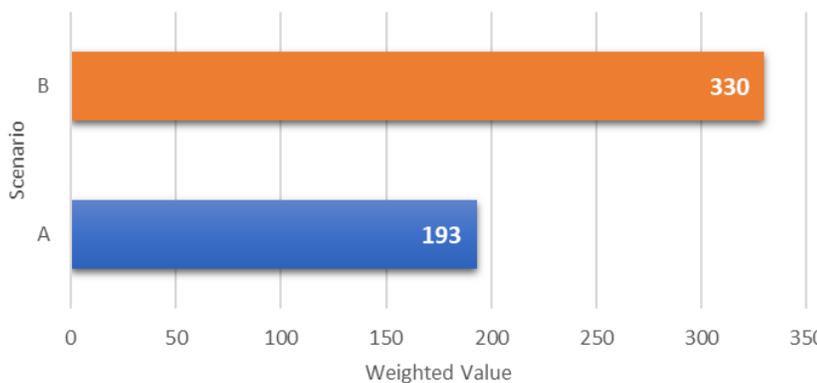


Scenario B had an overall more positive ranking than Scenario A of:

150%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

Summary of Weighted Values of Scenario Ranking - Economic Development

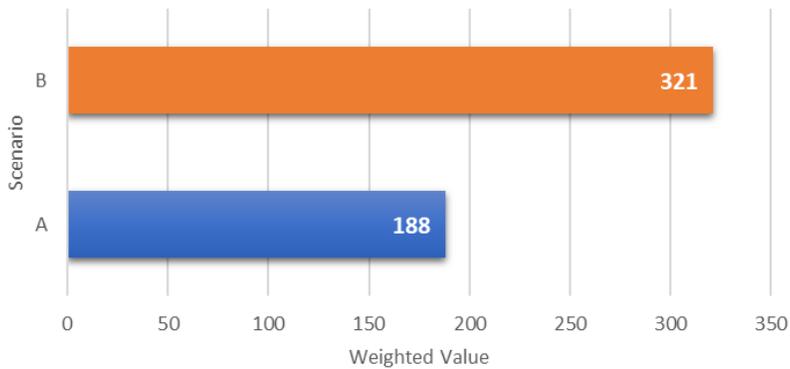


Scenario B had an overall more positive ranking than Scenario A of:

171%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.

Summary of Weighted Values of Scenario Ranking - Quality of Life



Scenario B had an overall more positive ranking than Scenario A of:

171%

(For this calculation, the number of stars in responses were given a "weight" (1 star = 1, 2 stars = 2, 3 stars = 3, etc.). These weights were multiplied by the number of responses and the score for each scenario is the product of the weighted values. These scores were then compared between scenarios to show how much one scenario's score differed from the other.