APPENDIX C: PROCESS AND METHODOLOGY

Overview of Methodology

During the development of the "*Bigger. Better. Texas."* plan, a variety of qualitative and quantitative analyses were conducted to inform the development of our data-driven, research-backed strategy.

In this section, the methodologies for the following key analyses are outlined:

- **Economic Analysis:** A series of analyses conducted in accordance with our pillars — business and industry, innovation and entrepreneurship, infrastructure, and workforce. The findings from the economic analysis informed our understanding of Texas' current state economy.
- **Plans Analysis:** The review and assessment of over 40 plans from private, public, and non-profit entities at the state, regional, county, and local level informing Texas' economic development. The analysis informed our understanding of economic development priorities across the state.
- **Target Sector Analysis**: The selection and analysis of the target sectors and clusters. The analysis identifies industries that will strengthen our competitive advantage and enhance our global competitiveness.

Economic Analysis

The economic analysis was a foundational part of the plan's development that focused on establishing an understanding of Texas' economy through the lenses of the plan's core pillars: Business and Industry, Innovation and Entrepreneurship, Workforce, and Infrastructure. The analysis aimed to pinpoint Texas' strengths, assess how the state compares to peer states and countries, and identify opportunities to advance the state's global competitiveness.

The analysis incorporated qualitative research, quantitative evaluations, and stakeholder feedback that was synthesized and cross-referenced to identify key takeaways. Peer states and countries were selected based on their economic and/or demographic similarities to Texas (e.g., rate of population growth, rate of GSP/GDP growth). Economic analyses were conducted using the methodology described below:

Step 1. Identified and Validated Key Economic Analyses: In accordance with the core pillars, an outline of analyses addressing key questions related to the current state of Texas' economy was developed. The outline was reviewed by stakeholders and iterated on to incorporate their feedback.

Step 2. Identified Sources and Gathered Data: Based on the finalized outline, data sources were identified, and data was extracted. A core source of the analyses was the economic impact software provider IMPLAN. Other sources frequently cited were the U.S. Census Bureau, American Community Survey, and the U.S. Chamber of Commerce.

Step 3. Analyzed Data: Values pulled from the sources were analyzed to identity trends and key takeaways. Activities in this step included adjusting figures for inflation (where appropriate), comparing Texas figures against peer states and countries, designing the visual representation of the data, and more.

Step 4. Validated Key Takeaways and Finalized Analyses: Findings were cross-referenced with desktop research and stakeholder feedback. Several rounds of iteration were completed to reflect stakeholder feedback and confirm consistency across publications.

Plan Analysis

Texas' economic development is informed by a variety of plans developed by entities at the state, regional, county, and local level. To ensure key themes from already existing plans are reflected, a plans analysis was conducted during the initial phase of strategic planning for *"Bigger. Better. Texas."*

The plans analysis incorporated a multi-step process that assessed a sample of plans based on defined criteria. The multi-step process was designed to ensure that the sample of plans selected are reflective of Texas' geographic diversity and robust economic development ecosystem. The plans analysis was executed as follows:

Step 1. Mapped Plans Landscape: Texas' economic development plans landscape was mapped by geography (state, region, county, and local) and type (public, private, and non-profit). This provided an overview of the pool of plans available for consideration in the analysis.

Step 2. Designed Selection Criteria: The landscape overview was used to design the criteria that facilitated the selection of plans for the analysis. The criteria included sampling plans that reflected a mixture of geographies and entity types. This ensured that the plans selected for analysis were reflective of Texas' economic development landscape. A full list of analyzed plans is included in the table below.

Step 3. Analyzed Plans: Selected plans were reviewed and analyzed to identify key points and common themes.

Step 4. Identified Key Takeaways and Opportunities: Based on the review and analysis of the plans, key takeaways and opportunities were identified and incorporated in the Statewide Economic Development Strategic Plan.

A list of the plans incorporated into the plans analysis are outlined below:

Region	Organization	Plan Name
Statewide	Economic Incentive Oversight Board	*Economic Incentive Oversight Board Legislative Report*
Statewide	Texas Association of Business	*Texas Competitiveness and Resiliency Strategy*
Statewide	Texas Workforce Investment Council	*Accelerating Alignment: Texas Workforce System Strategic Plan for Fiscal Years 2024 - 2031*
Statewide	The Texas Economic Development Council	*Texas Economic Development Council Strategic Plan*
Statewide	Travel Texas	*Travel Texas Strategic Marketing Plan*
Central Texas	Austin Energy	*Austin Energy Strategic Plan*
Central Texas	Brazos Valley Council of Governments	*Brazos Valley Council of Governments Comprehensive Economic Development Strategy*
Central Texas	Capital Area Council of Governments	*Capital Area Council of Governments Comprehensive Economic Development Strategy*

Central Texas	Concho Valley Economic Development District	*Concho Valley Economic Development District Comprehensive Economic Development Strategy*
Central Texas	Development District of Central Texas	*Development District of Central Texas Comprehensive Economic Development Strategy*
Central Texas	Heart of Texas Council of Governments	*Heart of Texas Council of Governments Comprehensive Economic Development Strategy*
Gulf Coast	Greater Houston Partnership	*Houston Next*
Gulf Coast	Houston-Galveston Area Council	*Gulf Coast Economic Development District Comprehensive Economic Development Strategy*
High Plains	City of Amarillo and Amarillo Economic Development Corporation	*Align Amarillo Economic Development Strategic Plan*
High Plains	Nortex Economic Development District	*Nortex Economic Development District Comprehensive Economic Development Strategies*
High Plains	Panhandle Regional Planning Commission	*Texas Panhandle Comprehensive Economic Development Strategy*
High Plains	South Plains Association of Governments	*South Plains Economic Development District Economic Recovery and Resiliency Plan*
High Plains	West Central Texas Council of Governments	*West Central Texas Council of Governments Region Comprehensive Economic Development Strategy*
Metroplex	Tarrant Regional Water District	*Tarrant Regional Water District Strategic Plan*
Metroplex	Texoma Council of Governments	*Texoma Economic Development District Comprehensive Economic Development Strategy*
Metroplex	North Central Texas Council of Governments	*North Central Texas Council of Governments Comprehensive Economic Development Strategy*
Northwest Texas	Nortex Economic Development District	*Nortex Economic Development District Comprehensive Economic Development Strategies*
Northwest Texas	West Central Texas Council of Governments	*West Central Texas Council of Governments Region Comprehensive Economic Development Strategy*
South Texas	Alamo Area Council of Governments	*AACOG Economic Development District Comprehensive Economic Development Strategy*
South Texas	Boerne Kendall County Economic Development Council	*Boerne/Kendall County Economic Development Strategy Plan*
South Texas	City of Laredo	*City of Laredo Economic Development Strategy*
South Texas	City of San Antonio	*Economic Development Strategic Framework City of San Antonio Texas*

South Texas	Coastal Bend Council of Governments	*Coastal Bend Economic Development District Comprehensive Economic Development Strategy*
South Texas	CPS Energy	*CPS Energy Vision 2027*
South Texas	Golden Crescent Regional Planning Commission	*Golden Crescent Five-Year Comprehensive Economic Development Strategy*
South Texas	Kerr Economic Development Corporation	*Kerrville 2050 Comprehensive Plan*
South Texas	Lower Rio Grande Valley Development Council	*Lower Rio Grande Valley Regional Strategic Plan*
South Texas	Middle Rio Grande Development Council	*Middle Rio Grande Development Council Comprehensive Economic Development Strategy*
South Texas	South Texas Development Council	*South Texas Development Council Comprehensive Economic Development Strategy*
South Texas	Starr County Industrial Foundation (SCIF)	*Starr County Economic Development Plan*
Southeast Texas	Deep East Texas Council of Governments	*Deep East Texas Council of Governments and Economic Development District Comprehensive Economic Development Strategy*
Southeast Texas	Greater Houston Partnership	*Houston Next*
Southeast Texas	South East Texas Economic Development District Economic Development Strategy	*South East Texas Regional Planning Commission*
Upper East Texas	Arkansas Texas Regional Economic Development	*Tap Into Texarkana*
Upper East Texas	Ark-Tex Area Council of Governments	*The Northeast Texas Economic Development District Comprehensive Economic Development Strategy*
Upper East Texas	East Texas Council of Governments	*East Texas Economic Development District Comprehensive Economic Development Strategy*
Upper Rio Grande	El Paso Electric	*El Paso Electric Transforming Our Strategic Plan*
Upper Rio Grande	Rio Grande Council of Government	*West Texas Economic Development District Comprehensive Economic Development Strategy*
Upper Rio Grande	The Borderplex Alliance	*The 2025 Ascend Plan*
West Texas	Concho Valley Economic Development District	*Concho Valley Economic Development District Comprehensive Economic Development Strategy*
West Texas	Permian Basin Regional Planning Commission	*Permian Basin Regional Planning Commission Comprehensive Economic Development Strategy*
West Texas	West Central Texas Council of Governments	*West Central Texas Council of Governments Region Comprehensive Economic Development Strategy*

Target Sector Analysis

A crucial part of strategic plan development was the selection of the target sectors and clusters. Identifying target sectors and clusters for Texas was key to establishing strategic initiatives that strengthen our competitive advantage and enhance our global competitiveness.

Within this plan, 10 target sectors comprised of 23 target clusters were identified. The selection process required a method that is free of bias, data-driven, and holistic in understanding what drives our state's economy. The methodology for the identification of the target sectors (and its clusters) as well as the sector forecast calculations are outlined below.

Sector and Cluster Selection

The target sector and cluster selection methodology consisted of three major steps, with several activities falling below each step. At a high level, the target cluster selection methodology was designed to select a wide variety of targets for the state, spanning from historical strengths to emerging opportunities. The flexible methodology prioritized industries that are material to the statewide economy, either due to significant presence across regions or their ability to advance the statewide economy, and industries that create numerous jobs for Texans. The resulting target industry sectors and clusters included in the plan reflect these guiding principles.

The key sources leveraged for the sector and cluster selection were Harvard Business School (HBS) U.S. Cluster Mapping Project and the economic impact software provider IMPLAN. Additional sources incorporated for the analysis are identified throughout the steps. The selection analysis included these steps:

Step 1. Define: The team developed a comprehensive list of traded (i.e., not services) clusters that were then analyzed to identify and select target clusters. As a starting point, this analysis used existing cluster definitions from the Harvard Business School (HBS) U.S. Cluster Mapping Project. Additional clusters were added based on recent industry trends. This process results in 63 clusters, which are groups of industries defined by IMPLAN sector.

The steps executed to generate the list of clusters are outlined below:

1. Adopted Harvard Business School cluster definitions and redefined using 2022 NAICS codes: Used HBS U.S. Cluster Mapping traded cluster definitions at the 6-digit NAICS level. The HBS clusters, which uses 2007 NAICS codes, were redefined using 2022 NAICS codes using Bureau of Labor Statistics (BLS) Industry Classification conversion tables. The only modification to these clusters was splitting the Oil and Gas cluster into two clusters: Oil and Gas Extraction, Production, and Transportation; and Petroleum Refining and Chemicals.
2. Added additional clusters: Because the HBS clusters were defined about a decade ago, additional clusters were added to capture key trends in recent years — for example, Artificial Intelligence, Biotechnology, AgTech, and Advanced Manufacturing. Texas state and regional planning documents and national trends were used to identify which clusters should be added. To define each of these additional clusters using NAICS codes, the following sources were consulted:
    a. Centers of Excellence, Los Rios Community College District, Valley Vision, and Burris Service Group, 2015. Advanced Manufacturing Cluster: Workforce Needs Assessment.
    b. Kane, Sharon and Vanessa Shonkwiler, 2022. Defining Progress and Potential: An Assessment of the AgTech Industry in Georgia.

c. Harris, Christine, Margaret Collins, and Dennis Cheek, 2013. America's Creative Economy: A Study of Recent Conceptions, Definitions, and Approaches to Measurement Across the USA.

d. Mutis, Santiago, 2020. Privately Held AI companies by Sector. Center for Security and Emerging Technology.

e. Yum, Seungil, 2021. The Cluster Characteristics of Biotechnology Industries and Their Effect on Regional Innovation Systems. Industrial Biotechnology.

f. BLS, 2010. Green Goods and Services Industries by NAICS code.

3. Modified additional cluster definitions: To ensure the added cluster definitions are fit for purpose, some were modified by removing specific industries at the 6-digit NAICS level. These NAICS codes were removed based on the guiding principle: *To be included in the cluster, the industry must directly contribute to the cluster rather than only being affected by downstream implications.*

4. Redefined clusters using IMPLAN data: Data on employment, output, and exports were provided by IMPLAN. The clusters defined at the 6-digit NAICS level were matched with IMPLAN codes based on IMPLAN sector to NAICS bridges provided by IMPLAN. IMPLAN sectors are typically aligned with 3- or 4-digit NAICS codes. As a result of aligning clusters defined at the 6-digit NAICS level to industries defined at the 3- or 4-digit NAICS level, this step broadened the cluster definitions.

5. Reviewed clusters after NAICS-IMPLAN bridges and modified as needed: After redefining clusters using IMPLAN sectors, some industries were removed from clusters if the new definition was too broad to include in the cluster. For example, the Creative cluster includes NAICS 459920 – Art Dealers. However, when matched with the broader IMPLAN sectors, this was translated to "Retail – Miscellaneous store retailers" and "Retail – Non-store retailers". Art dealers account for a small portion of these broad categories and including them in the Creative cluster would be misleading; this IMPLAN sector was therefore removed from the Creative cluster.

The result of these steps is a list of 63 clusters defined by IMPLAN sector. Importantly, these clusters are not mutually exclusive (i.e., the same industry may be included in multiple clusters). While the HBS clusters are mutually exclusive, the steps above introduce non-mutual exclusion in several places:

1. Converting HBS clusters from 2007 NAICS codes to 2022 NAICS codes.

2. The industries included in the added clusters overlap with the HBS clusters.

3. Non-one-to-one mapping between NAICS codes and IMPLAN sectors.

As a result, clusters may not be summed as doing so would lead to double counting indicators from any IMPLAN industries included in multiple clusters.

Step 2. Analyzed and Evaluated:

The next step in the target cluster selection included a data-driven analysis and evaluation of all target clusters identified in Step 1. The data-driven approach was designed to prioritize industry clusters that are "high-quality," e.g., industries that drive strategic growth, and "material" to the state economy, e.g., industries that generate significant economic activity.

The steps implemented to generate the pool of potential target clusters are outlined below:

1. Collected data for the pool of potential target clusters: Data on employment, output, GDP, and exports were provided by IMPLAN. In step 1, the clusters defined at the 6-digit NAICS level were matched with IMPLAN codes based on IMPLAN sector to NAICS bridges provided by IMPLAN. IMPLAN data was collected at the IMPLAN 546 industry level and aggregated up to the cluster definitions established in step 1.

2. Defined evaluation metrics and criteria to identify target clusters: Metrics and criteria were established to identify high-quality," e.g., growth-driving industries that create employment opportunities for Texans, and "material" to the state economy, e.g., industries that generate significant GDP or have a strong regional presence. The metrics and evaluation criteria are summarized in the table below.

Evaluation Metric	Evaluation Criteria
"High-Quality" Cluster	
Exports / Output	Above 10%
Total Employment	Above 50th percentile for all clusters
Average Wage	Above 25th percentile for all clusters
"Material" Cluster	
GDP Contribution	Above 50th percentile for all clusters
OR	
Presence across regions	"High-Quality" in 7+ regions

3. Analyze cluster data to identify target clusters that meet defined evaluation criteria: The cluster data collected from IMPLAN was then analyzed to pull out industry clusters that met the evaluation criteria established above. This step resulted in a pool of industry clusters considered "high-quality" and "material" in Texas' economy.

Step 3. Refined and Finalized:

In the final step, the narrowed pool of potential target industry clusters resulting from step 2 was evaluated further using qualitative research and stakeholder engagement. This pool of "high-quality" and "material" clusters that met the established evaluation criteria was reviewed and refined to the final list of target clusters, first using professional judgment and then using stakeholder feedback. The final list of target clusters was then grouped into target industry sectors based on industry similarities.

The steps to generate the final selection of target sectors and clusters are outlined below:

1. Conducted qualitative review of narrowed pool from step 2: The pool of "high-quality" and "material" clusters was reviewed to see if any additional clusters should be removed on a qualitative basis. Using qualitative analysis and professional judgment, additional industry clusters were removed if they were duplicative with other cluster(s) included in the list (e.g., chemical and plastics cluster being duplicative with a chemicals cluster and a plastics cluster in the pool), if economic activity in the cluster was driven by peripheral industries (e.g., coal mining cluster activity being driven by nonmetal mining services), or if cluster is expected to grow alongside economic expansion (e.g., construction products and services cluster expected to grow as population and businesses expand). The result of this analysis was a further refined pool of potential target clusters.

2. Grouped target clusters into target sectors: The further narrowed pool of potential target clusters was grouped into target sectors based on industry sector similarities. For example, the Oil and Gas

Extraction, Production, and Transportation, Electric Power Generation and Transmission, and Renewables clusters were grouped into a target sector called "Energy Evolution."

3. Socialized and iterated: The further narrowed pool of potential target clusters was then taken to various stakeholder groups for feedback. The quantitative analysis conducted in the first two steps was complemented with this qualitative engagement to ensure that the list of target sectors and clusters is reflective of Texas' economic past, present, and future. Stakeholder feedback was incorporated to finalize the list of target sectors and clusters, including refining sector and cluster names and groupings.

Texas Cluster Forecast Methodology

This analysis provided employment and GDP projections for Texas' target clusters. The forecast provides insights into the future outlook of these key industries to help understand the workforce needs and anticipated industry growth. The forecast aligns with existing Texas Comptroller forecasts at the broad industry level but provides more detailed industry information. Growth rates from the BLS national projections are used to disaggregate the Comptroller estimates to a more detailed industry level.

More specifically, this analysis applies Bureau of Labor Statistics (BLS) national growth rates between 2022 and 2032 at the detailed industry level (up to 4-digit NAICS) to 2022 IMPLAN employment and value-added data for Texas. The 2022 and 2032 values produced through this process are adjusted to align with Texas Comptroller data. The steps to complete this assessment are detailed below:

Step 1. Used IMPLAN bridge to Match IMPLAN Sectors with Corresponding NAICS Code(s): Employment and GDP data by IMPLAN sector were matched with the corresponding NAICS code (typically 3- or 4-digit) using the IMPLAN to NAICS bridges provided by IMPLAN.

Step 2. Rescaled 2022 IMPLAN Data to Align with Comptroller values: 2022 Employment and GDP values from IMPLAN were matched with the Comptroller data based on 2-digit NAICS. GDP values were converted to 2021 dollars using a consumer price index (CPI) adjustment. The 2022 estimates at the IMPLAN sector level were rescaled to align with the estimates provided in the Comptroller data. This step ensured that the historical values are aligned with the Texas Comptroller estimates.

Step 3. Match Rescaled 2022 Estimates with BLS Projections: The rescaled 2022 employment and GDP estimates are matched with BLS projections based on the most granular level of industry disaggregation available. In most cases, this match is at the 3- or 4-digit NAICS level.

Step 4. Applied National Differential Growth Rates to 2022 Values to Project 2032 Values: The 2022 and 2032 employment and output estimates from the BLS national industry projections were used to calculate the corresponding growth rates, by industry. These growth rates were applied to the rescaled 2022 employment and GDP values to project 2032 values for the state of Texas.

Step 5. Rescale Projected 2032 Values to Align with 2-digit Comptroller Data: The projected 2032 values were rescaled to align with the high-level forecasts provided by the Comptroller. As a result of this step and step 2, both the 2022 and 2032 totals match the Comptroller values, but the relative growth in each sub-sector is determined by the national level growth rate.

Step 6. Aggregated by Cluster: Forecasted values were aggregated to match the clusters defined in the Cluster Analysis based on the IMPLAN industry.