

Vision Calcasieu

Appendix D: Scenarios Analysis

2009



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1. OVERVIEW

The Future Land Use Map was developed by identifying alternative growth scenarios for the Parish. The alternative scenarios were generated through a Growth Allocation Exercise conducted at a community workshop. This summary describes the background assumptions used for scenario development, the growth allocation exercise, the resulting growth scenarios and the relative impacts of those scenarios.

2. GROWTH PROJECTIONS

Residential and non-residential growth projections used in the scenario development were based on the Parish-wide population and employment growth projections contained in the Transportation Master Plan produced by Alliance Transportation Group, with the 2006 US Census American Community Survey population and employment estimates used as base data. These projections are discussed in further detail in the Transportation Master Plan.

Exhibit 1: Projected Residential Growth

Parish	Population	Dwelling Units
Today (2006)	184,524	81,787
Future (2025)	210,761	92,117
Change (2006-2025)	26,237	10,330

Exhibit 2: Projected Non-Residential Growth

Parish	2006	2025	Change (2005-2025)
Commercial	34,649	48,194	13,545
Office	24,427	33,976	9,549
Industrial	21,623	30,076	8,453
Total	80,699	112,247	31,548

Growth projections are as much an art as a science. While the projections presented here are based on the best available data, actual growth rates will be influenced by a variety of conditions, including events or changes in the development climate that are unforeseen today. More rapid growth may result in Calcasieu Parish reaching the projected population before 2030. Slower growth may result in a smaller population than projected in 2030.

3. GROWTH ALLOCATION EXERCISE

The Growth Scenarios discussed in this report are the result of the Growth Allocation Exercise that was conducted at a community workshop held on February 12, 2008. Using development tiles, participants were asked to geographically distribute growth to achieve their vision for the future of the Parish.

For the purposes of the Growth Allocation Exercise, projected growth was translated into scaled “Development Tiles” using the following development types:

- Rural Residential – 0.2 dwelling units per acre (5 acre lots);
- Low Density Residential – 2 dwelling units per acre;
- Moderate Density Residential – 5 dwelling units per acre;
- Commercial – 27 employees per acre;
- Office / Business Park – 37 employees per acre; and
- Industrial – 30 employees per acre.

Each tile was scaled to the map, meaning that each tile took up as much area on the map as the corresponding development was expected to consume in land.

Workshop participants worked in small groups to collectively define a vision for the Parish and construct a map corresponding to that vision. Each group was provided with tiles representing the same amount of residential and non-residential development. Additionally, each group had the same information about development constraints (e.g., elevations, storm surge areas, floodplains, and wetlands), infrastructure availability, zoning and existing land use patterns. The groups varied the location and character of development that would accommodate projected growth. The workshop produced twelve distinct future land use maps that were reviewed for common and divergent themes. These themes were used to generate three growth scenarios.

4. GROWTH SCENARIOS

The Community Survey conducted for this project presented three possible growth patterns for the Parish. These possible growth patterns were based on information presented to the public as part of the Louisiana Speaks project.¹ These growth patterns, which are illustrated in Maps 1, 2 and 3, included:

- **Dispersed Development** – The concept for this pattern was to maintain the current development trend throughout the Parish, with more development scattered in unincorporated areas than within existing cities.
- **Activity Centers and Growth Corridors** – The concept behind this pattern was to focus development in Centers along major Corridors such as I-10 and US 171.
- **Compact Growth** – This concept focused the majority of growth to existing areas developed at urban intensities.

These patterns, in conjunction with the Growth Allocation Maps, served as the foundation for the alternative scenario maps. The following scenarios were derived from the growth allocation maps as well as the concepts.

Trend Scenario: This scenario maintained a development pattern similar to existing development trends. It included significant traits from the allocation workshop maps. New development was located to approximate the population and employment projections used in the Transportation Master Plan. In this scenario, growth was dispersed throughout the Parish,

¹ For more about the growth patterns presented in the Community Survey, please see the Survey Summary.

with relatively little infill and redevelopment within existing incorporated communities.

Compact Scenario: This scenario concentrated most new development in and immediately adjacent to existing communities. Growth was primarily located adjacent to or within existing communities, particularly DeQuincy, Iowa, Lake Charles, Moss Bluff, Sulphur, and Vinton.

Corridors and Centers Scenario: This scenario focused development in activity centers and along major transportation corridors. It included centers as defined in the allocation workshop maps. Growth was concentrated along major transportation routes and in activity centers identified through the Growth Allocation Workshop, including existing communities and major intersections.

5. SCENARIO ANALYSIS

Each alternative scenario was analyzed using GIS software to determine the relative impacts of different growth patterns. The goal of this analysis was to quantify and compare the impacts of each scenario in order to facilitate evaluation and the ultimate development of the Future Land Use Map.

5.1. HOUSING

While population growth was constant between the three scenarios, each growth scenario was given a different mix of housing types as appropriate based on the scenario concept.

Trend: Detached, single-family residences in automobile-dependent neighborhoods will continue to be the dominant housing form.

Compact Growth: Broadest mix of housing choices that will most effectively meet the needs of seniors, workforce and special needs populations.

Corridors and Centers: Provides more opportunities than the Trends Scenario for senior housing. Likely to be somewhat constrained for workforce housing without targeted efforts because detached, single family units will continue to make up more than two-thirds of all new dwellings.

The residential land use distribution based on these housing needs established a shift in residential land use from very low density to higher densities, as shown in **Exhibits 3 and 4**. The Trend scenario closely followed existing residential trends based on lot sizes in the Parish. In the Compact Scenario, new residential development shifted to reflect greater emphasis on development in incorporated areas, where moderate densities are supported by urban services and surrounding services. Similarly, in the Corridors and Centers scenario, new residential development shifted to reflect greater emphasis on development in and around activity centers, including both incorporated and unincorporated communities and centers.

Exhibit 3: Residential Land Use Distribution

	Trends	Compact	Corridors
Rural Density	15%	10%	10%
Low Density	70%	30%	60%
Moderate Density	15%	60%	30%

Exhibit 4: Housing Build-Out Potential

	Trends	Compact	Corridors
Rural Density	1,924	1,307	1,295
Low Density	9,082	3,824	7,698
Moderate Density	1,870	7,730	3,840
Total	12,876	12,054	12,833

As show in **Exhibit 5**, the Compact Scenario consumes the least amount of vacant land while the Trend Scenario consumes 69 percent more vacant land than the Compact Scenario. Corridors nearly split the difference between Compact and Trends.

Exhibit 5: Vacant Acreage Consumed by New Dwelling Units

	Trends	Compact	Corridors
Rural Density	9,618	6,533	6,473
Low Density	4,541	1,912	3,849
Moderate Density	374	1,549	768
Total	14,533	9,991	11,090

5.2. NON-RESIDENTIAL LAND USE

Each scenario contained a different geographic distribution of non-residential land uses. In the Trend scenario, non-residential land uses were scattered throughout the Parish, with most industrial land uses located in or adjacent to existing industrial areas. In the Compact scenario, non-residential land uses were predominately located within existing communities and most new industrial development was located in existing industrial areas and adjacent to the Chennault Business Park. In the Corridors and Centers scenario, non-residential land uses were predominately located along the I-10 corridor, with additional non-residential development in DeQuincy, Moss Bluff, and south Lake Charles

adjacent to the airport. Most new industrial development was located in existing industrial areas.

5.3. ENVIRONMENTALLY CONSTRAINED AREAS

Calcasieu Parish contains significant areas of land constrained for development by floodplain and storm surge area. Overlap with development constraints such as floodplain and storm surge was calculated for new development per scenario and is summarized in Exhibits 6 and 7. For each scenario, an attempt was made to avoid constrained areas as much as possible. The Trend scenario contains the greatest amount of development within floodplain and storm surge areas to mimic existing development trends.

Exhibit 6: New Development Within Constrained Areas (in Acres)

	Trends	Compact	Corridors
Floodplain	5,314 (32%)	1,639 (14%)	939 (7%)
Storm Surge	4,768 (29%)	676 (6%)	1,028 (8%)

Exhibit 7: Dew Development Within Constrained Areas (Percent)

	Trends	Compact	Corridors
Floodplain Dwellings	2,235 (22%)	990 (10%)	780 (8%)
Floodplain Employees	5,175 (16%)	8,691 (14%)	4,596 (15%)
Storm Surge Dwellings	1,373 (13%)	465 (5%)	845 (8%)
Storm Surge Employees	3,789 (12%)	4,144 (13%)	2,931 (9%)

5.4. AMENITIES

The scenario analysis calculated the proximity of dwelling units to amenities such as a park, school, or library. The “amenity areas” defined for this analysis included land within a one-half mile of a park or elementary school and land within three miles of a library. As summarized in **Exhibit 8**, Compact Scenario outperformed the other scenarios with nearly all development occurring within an amenity area.

Exhibit 8: Proximity to Amenities

	Trends	Compact	Corridors
Dwellings - 2025	6,553	9,707	6,822
Dwellings at Build-out	8,168	12,083	8,473
Percent	63%	94%	66%

5.5. ECONOMIC IMPLICATIONS

While quantitative analysis of the economic development implications is difficult, some qualitative implications may be drawn from the three scenarios. Under the Trend scenario, new dwelling units may be too dispersed to attract commercial development that relies on a certain number of dwelling units within a defined service area. Commercial development is likely to be heavily auto-oriented and dependent. Conversely, the Compact scenario provides the greatest support for mixed-use development due to focus on infill and redevelopment in existing communities and for neighborhood-based services and businesses. Under the Corridors and Centers scenario, new businesses may emphasize highway-oriented commercial opportunities due to the focus on development along major transportation routes such as I-10, while neighborhood-based businesses may flourish in the defined centers.

5.6. PUBLIC FACILITIES & INFRASTRUCTURE

The scenarios analysis examined the proximity of new development to existing public facilities and infrastructure in order to determine possible needs for new infrastructure. This analysis was limited by incomplete information, particularly on the location and extent of the water distribution network in the Parish. As expected due to its geographic distribution near existing communities, Compact outperformed the other scenarios.

In Calcasieu Parish, water is provided by nine active water districts and by municipalities. Each scenario had a different implication for water service needs as measured by the proportion of growth located in an active water district, which is summarized in **Exhibit 9**. For the Trend scenario, centralized water service expansions will be required where on-site water is not feasible. For the Compact scenario, most new development may rely on existing municipal water systems, although some extensions will be

required. Under the Corridors and Centers scenario, new development will require extensions of municipal or water district facilities.

Exhibit 9: Development Within Water Districts

	Trends	Compact	Corridors
Dwellings in a Water District / City	9,190 (89%)	9,775 (95%)	9,701 (94%)
Employees in a Water District / City	24,193 (77%)	31,547 (100%)	26,544 (84%)

While the Parish is studying the provision of parish-wide wastewater services, at the time of this analysis, wastewater collection and treatment is provided by four active sewer districts and by each municipality. Each scenario had a different implication for wastewater service needs, which is summarized in **Exhibits 10 and 11**. For the Trend scenario, on-site treatment will continue to be the predominant form of sewer service. Under the Compact scenario, most new development will rely on existing municipal wastewater systems, though some extensions will be required. Under the Corridors and Centers scenario, significant new sewer service development will be required to serve specific corridors and centers.

Exhibit 10: Acreage Proximate to Wastewater Systems

	Trends	Compact	Corridors
Within or in proximity to municipal systems	1,075 Acres	2,066 Acres	880 Acres
Percent	6%	17%	7%

Exhibit 11: Development Proximal to Wastewater Systems

	Trends	Compact	Corridors
Dwellings in a Sewer District / City	5,840 (57%)	9,034 (87%)	5,557 (44%)
Employees in a Sewer District / City	21,568 (68%)	21,268 (67%)	12,598 (40%)

A response radius was used to determine the amount of development within a 4 minute “urban response area” from existing fire stations (see **Exhibit 12**). This response radius does not reflect actual drive times or response times. Currently, station response times are varied based on the

location and the proportion of volunteer firefighters. For remote volunteer stations with a high proportion of firefighters away at jobs, response times will be well over 10 minutes, regardless of the proximity of the fire station to a fire. Again, due to its geographically dispersed pattern, the Trend scenario resulted in the least development within an urban response area.

Exhibit 12: Development Within Theoretical 4-Minute Emergency Response Radius

	Trends	Compact	Corridors
Acreage within 4 minute response radius	4,768 Acres (28%)	5,716 Acres (47%)	8,368 Acres (65%)
Dwellings within 4 minute response radius	1,712 DUs (13%)	3,938 DUs (31%)	8,337 DUs (65%)

A transportation networks analysis of the three scenarios was performed by Neel-Schaffer Engineering, as shown in **Exhibit 13**. The Compact scenario performs best under most transportation indicators, such as the least amount of congestion and the shortest average trips, in both length and time. The Corridors and Centers scenario produces the most intrazonal trips, or trips that are entirely contained within one Traffic Analysis Zone, and the fewest hours of delay.

Exhibit 13: Transportation Analysis, 2025

	Trend	Compact	Corridor
Vehicle Miles Traveled	8,907,878	8,661,259	8,820,766
Vehicle Hours Traveled	207,657	198,513	199,179
Congested Lane Miles	308.94	292.19	297.22
Average Trip Length (miles)	10.65	10.38	10.87
Average Trip Length (min)	16.13	14.97	16.1
Total Trips	884,735	884,555	884,637
Intrazonal Trips	50,744	51,353	62,375
Vehicle Hours of Delay	36,198	35,041	33,017