



Paradise Municipal Plan Review

Background Report

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BACKGROUND REPORT

1. Introduction

This report provides the context for a review of the Paradise Municipal Plan, describing key historical, socio-economic, land use, and environmental characteristics of the Town. It highlights the challenges and opportunities that can be addressed in a new Municipal Plan that will guide decisions about land use and development in the community over the next decade.

1.1 Historical Context

People have lived in Paradise since the late 1800's when the area was settled for farming and logging. Governor Thomas Cochrane believed that a road between St. John's and Topsail would enable residents from Conception Bay to take their produce to sell in St. John's. A makeshift road, now Topsail Road, officially opened in 1836 but poor soils and climate prevented the development of farmland in the area, and no one settled along the road until the 1890s.

In the early 1880's, a railway passed through Paradise with a station stop, known as Irvine, near Octagon Pond. People of Horse Cove made a rough path (now St. Thomas Line) to provide an overland route to Topsail and Irvine. In 1902, the government allotted funds to improve this road to allow the use of horse and cart. Some believe that "Professor" Charles H. Danielle was the first resident of Paradise. Danielle built Octagon Castle, a desired destination for guests from St. John's, on Topsail Road in 1895.

The early settlers in the area that is now the Town of Paradise supported themselves in a variety of ways, mainly through the sale of firewood to residents of St. John's, cutting rinds for fish flakes, as coopers, as seal hunters, miners on Bell Island, or working with the railway.

Paradise first appeared in the Census of 1911 with a population of 96. Since the post-war period, the community has evolved from a recreational destination to a rapidly growing suburban community. Incorporated as a municipality in 1971, the Town was also amalgamated with the Town of St. Thomas as well as other developed areas including Three Island Pond, Topsail Pond, Elizabeth Park, and Evergreen Village following dissolution of the St. John's Metropolitan Board in 1992.



Early settlers at Paradise; Mr. and Mrs. David Lynch, formerly of Bishops Cove, Conception Bay.
Source: The Encyclopedia of Newfoundland and Labrador

Paradise is distinct in the region as a relatively new community that did not evolve around resource based industries such as fishing and agriculture. Due to growth in the industrial areas of the Town, Paradise has shifted from a community that primarily functioned as a bedroom community for residents who are employed in the major employment centres of the St. John's Urban Region, to a community with decreasing dependence on the outside economy.

1.2 Paradise in the Regional Context

Paradise is one of fifteen communities in the St. John's Urban Region. The 1976 Regional Plan identified Paradise as a "local centre" which would grow within the limits of its municipal servicing, finance and road capacity, remaining low-density with local commercial and small-scale industrial land use. The Regional Plan envisioned a development axis from St. John's through Mount Pearl to Conception Bay South with the then proposed Harbour Arterial Road, the Manuals Connector and the Conception Bay South By-Pass Road facilitating this growth direction. However, the Regional Plan failed to recognize the impact that this would have on the Town of Paradise, where little growth was originally anticipated.

Regional servicing, the build out of the regional arterial road network and the Outer Ring Road in particular, facilitated growth in Paradise.

The original Regional Plan also set aside a significant area of land in Paradise for future regional industrial development. Today, the development of these lands make a significant contribution to the long-term sustainability of the Town, providing a healthy commercial tax base and local employment.

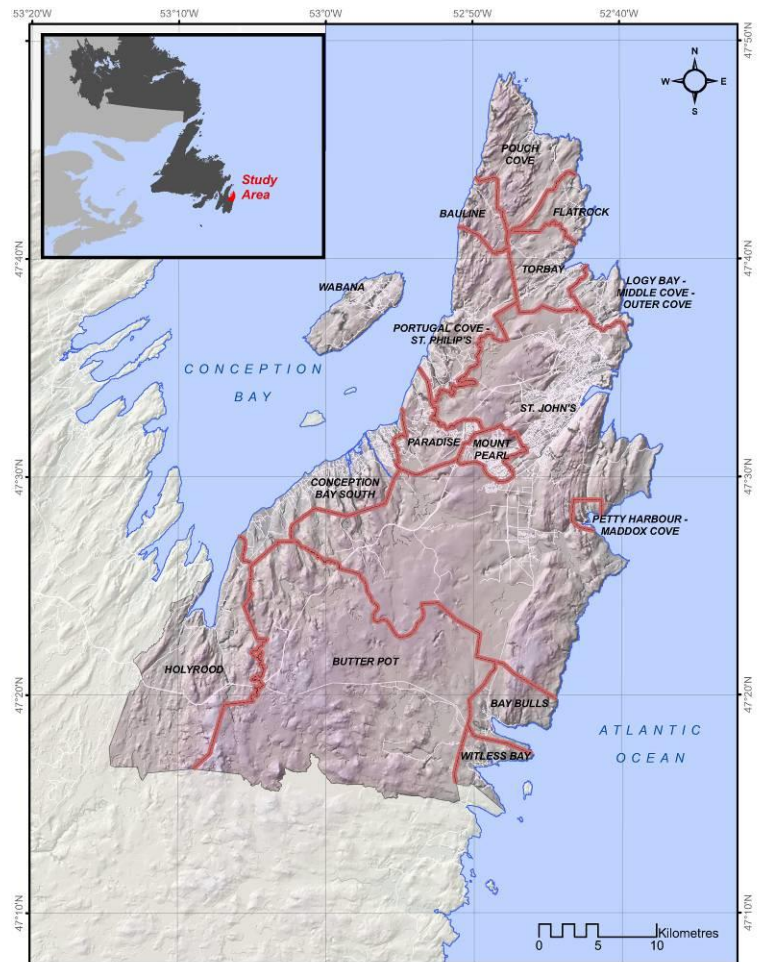


Figure 1. Northeast Avalon Region.

2. Population

2.1 Demographics

Population growth in the community (Figure 2) has been continuous since 1981, increasing over 400% between 1981 and 2011. The most recent census data shows the population of Paradise to be 17,695, an increase of 5,111 over the 5-year census period since 2006. The Town estimates that the population in 2014 is approximately 19,500. An analysis of population projections for the Northeast Avalon Region by the Newfoundland Statistics Agency in 2009 showed that population of Paradise could increase to about 20,000 by 2031. Considering the 2009 projection of 20,000 persons by the year 2031 and the Town's current population of 19,500, it is clear that the Town is experiencing a higher population growth than indicated by earlier trends.

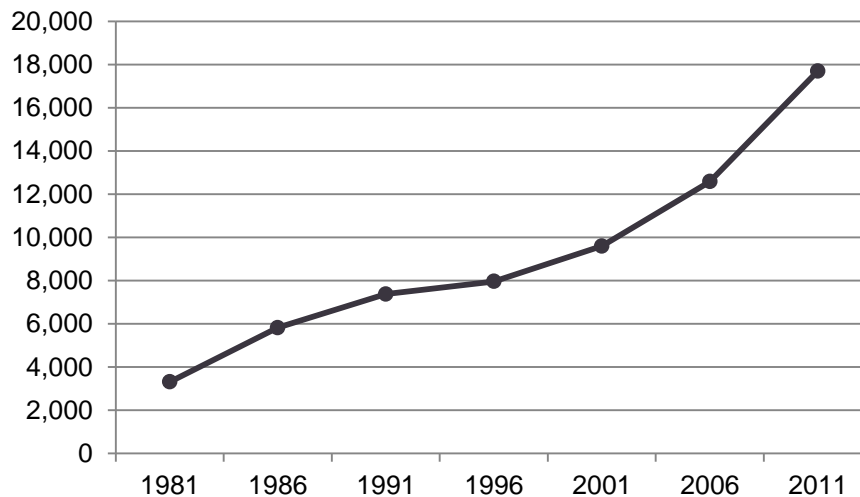


Figure 2. Population Growth - Paradise (1981 to 2011)

Figure 3 shows the density of the population in the Town. While the map is based on data from 2011, it does indicate that the densest areas are in the Elizabeth Park area, including both the older portions developed in the 1980s and more recent residential subdivisions. Other areas include the area around Adams Pond that has been under continuous development for the past twenty years.

The 2011 Census indicates that the total number of households in the Town is 6,500. At the same time, the average number of persons per household has been declining – from 3.3 in 1991 to 2.7 in 2011. Data also show that there are between 550 and 600 lone parent family households in the community.

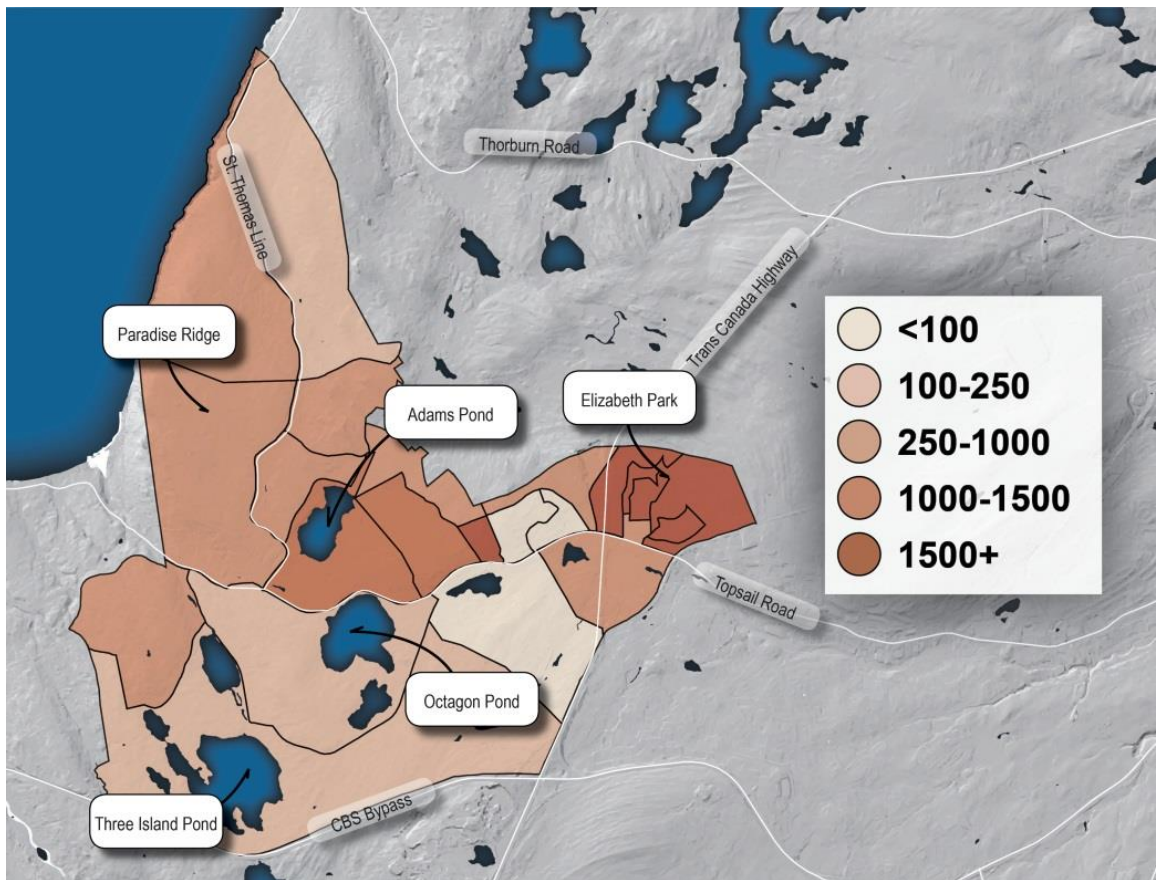


Figure 3. Paradise Population Density (per square km) (2011)

The Town has continued to attract and retain new families during periods where many communities in Newfoundland and Labrador have experienced population decline, particularly of young people and families through out-migration. A robust provincial and regional economy, the completion of the Outer Ring Road, and the availability of serviced land have all contributed to the growth of the community and to the continued demand for residential development.

The population pyramid for Paradise (Figure 4) is unlike that of the province as a whole (Figure 5), and most other communities in that the younger age cohorts make up a healthier proportion of the total population than those typical of an aging population.

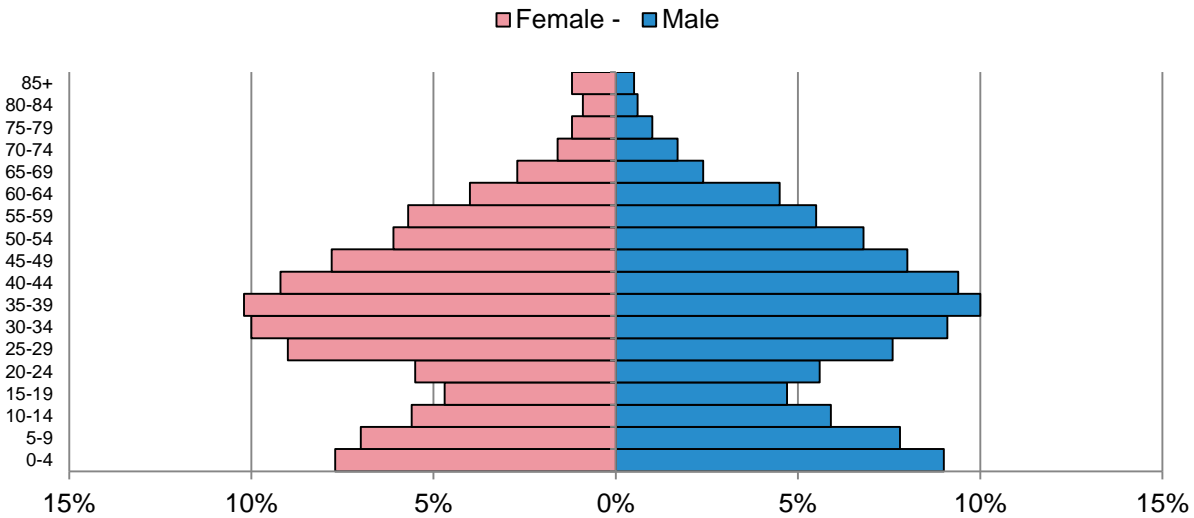


Figure 4. Population by Age and Gender - Paradise (2011)

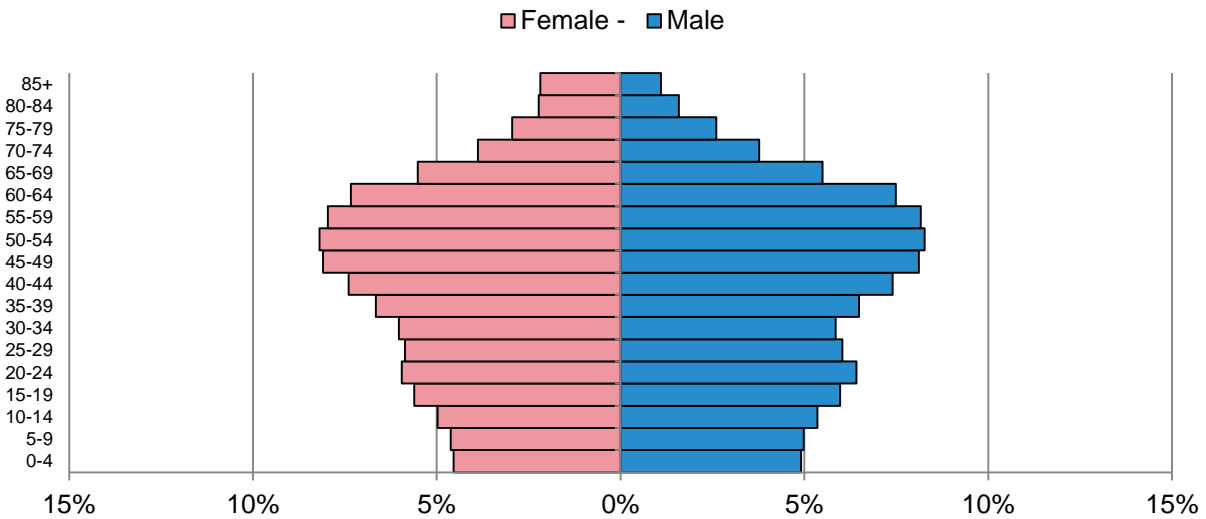


Figure 5. Population by Age and Gender - Newfoundland and Labrador (2011)

The largest proportion of the population is of working age – between 25 and 55, compared with the provincial population in which the largest bulge in the pyramid is made up of people approaching the typical age for retirement or over with a smaller proportion of young people at the bottom. Paradise, on the other hand, is experiencing an increase in the number of children. Between 2011 and 2012, the number of births in Paradise increased 8% and the birth rate is almost double that of the province as a whole – 16.1 per 1,000 population compared to 8.6 per 1,000 for the province.

The number of children in Paradise has resulted in demands for schools, recreation, and other facilities to meet the needs of the growing number of young families.

At the other end of the age pyramid, are those people who have entered or are about to enter their retirement years. At present, 17% of the population of the community are age 55 or older. As these people age, their need for health services, recreation facilities and programs, housing and accessibility changes.



Better health care and more awareness of the importance of physical activity among the elderly, mean that they are living longer. In Paradise, the median age of death between 2004 and 2011 was 74. Women are living longer, on average to age 79, compared to 70 for men. This particular segment of the population – elderly women living in single person households - have additional needs, not only for affordable housing, personal safety, and security, but also for opportunities for social interaction and inclusion in the community.

Communities that want to encourage aging-in place need to consider how to meet the needs of their elderly population.

In the middle of the pyramid are the people of working age. Overall, the median age in Paradise is 35.2, eleven years younger than the provincial median age of 44.0. For this segment of the population who are typically busy balancing work and raising a family, the proximity of schools, recreation facilities, shopping and other services, as well as proximity to employment opportunities is important.

2.2 Labour and Incomes

As in many other communities, most of the working population of Paradise is employed in the sales and service industry but there is a large proportion who work in the trades, transport, and equipment operations industry.

Compared to the rest of the province, residents of Paradise have an annual personal income per capita of \$36,600 - \$7,700 greater than the provincial average. For couples, the average income is \$113,000 – over \$27,000 more than that of the province. The community has a very low unemployment rate (only 4.6% compared to a provincial rate of 14.6%) and with an incidence of low-income families of 11.3% (2010 most recent data).

Recognizing how the population of the community is and will change, and identifying ways to accommodate the needs of various age groups, is an important consideration for the Town as it develops a new Municipal Plan.

2.3 Community Health and Well Being

Many factors influence the health of individuals and their communities. While some factors such as socioeconomic status or employment conditions can be difficult to change, we have greater control over certain health-related behaviours, such as our eating habits and physical activity. When improved, these can have a positive impact on our overall health. There is a growing body of evidence that shows that the way communities are built influences the health of its citizens.

This section presents some indicators of health and well being for Paradise. While much of the information collected is reported for areas larger than the Town of Paradise, such as Local Area 17: Northeast Avalon, the Eastern Health Region, or the province, the statistics are relevant and applicable to Paradise. Where available, information specific to Paradise is used.

As demonstrated from the Canadian Community Health Survey of 2009-2010, Paradise residents' perception of their health status is positive - 65% of individuals age 12+ rated their health status as excellent or very good, compared to the provincial rate of 60.1%. Self-assessed mental health was rated as excellent by 51.8% of individuals. The rating for a very strong sense of belonging to the community was 71.8% for Paradise while the province was 80.3%. Ninety-two percent (92%) of respondents are satisfied with life in general, 11.2% report life stress as extreme or quite a bit.

Physical activity and the consumption of a healthy diet have a positive impact on reducing the prevalence of chronic diseases such as heart disease, diabetes, high blood pressure, and arthritis. In the Eastern Health Region, 56% of those surveyed reported being physically active during leisure time (defined as 150 minutes of moderate to vigorous activity per week), and 33.7% reported having limitations of activities due to health issues (Eastern Health, 2012). Over 90% of Paradise workers commute by car to their place of work and most children take the bus to school, thereby limiting opportunities for physical activity. The physical activity rate is higher than the provincial rate of 51%, but needs improvement. The construction of facilities such as parks, trails, gyms, and arenas in the Town is one way that Towns can facilitate active lifestyles.

It is well documented that there has been a steady increase of overweight and obesity throughout the Province and Canada. When surveyed, 62.5 % of Paradise residents reported an adult body mass index of 25 and greater (defined as overweight to obese category). Reported food and vegetable consumption, 5 times or more per day (2013) for the province were 21.2% for males and 29.4% for females, both rates well below the Canadian rates of 34% and 47.4% respectively. Providing convenient locations for access to food in a community, such as



community gardens and farmers markets, can contribute to healthier eating.

Hospital admission and discharge information provides a look at the types of illness in a community. The highest percentage (8.4) of hospital admissions during 2008-09 for Paradise was due to diseases of the respiratory system, followed by digestive and circulatory diseases for which the median age was 39. The most common cause of hospital admissions/discharges for those aged 60 and over for 2008-09 in Paradise were diseases of the circulatory system followed by diseases of the respiratory system and tumor related conditions. One third of all acute care hospital stays within the Eastern Health region are related to chronic disease. Chronic disease is a major cause of morbidity and mortality in the Eastern Health Region (Health Status Report Eastern Health 2012). From these indicators, it can be determined that some chronic disease presently exists within the population of Paradise and if there is no intervention, it will most likely follow current upwards trends as the population ages.

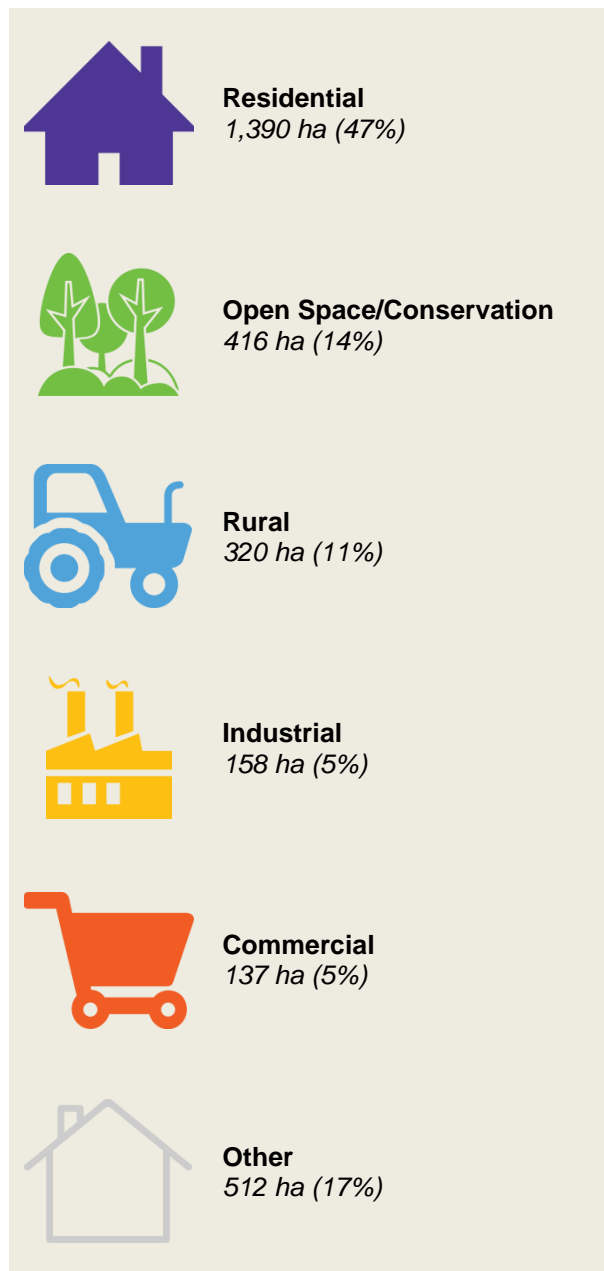
As in many suburban towns, the majority of the population of Paradise travel outside the Town for work, health care, grocery and other shopping. While this is starting to change with the construction of a new supermarket, new schools, and growing employment opportunities in the industrial parks and commercial areas, most of the things people need are not within walking distance for most citizens. More time spent in cars means that sufficient physical activity is difficult to achieve. Good Municipal Planning can identify areas where the Town can achieve greater opportunities for walking, cycling, and access to sports and recreation for all ages with the goal of reducing the human and economic burden of chronic disease and physical inactivity and improving the health of all citizens.

A growing body of research based evidence links the built environment to positive health outcomes. The vast majority of chronic diseases are preventable. Physical activity protects against heart disease, stroke, hypertension, Type 2 diabetes, some cancers, obesity, depression, anxiety, and stress. Regular physical activity assists with weight control, builds strong muscles, improves behavioural development in children, and helps the older adult retain mobility and independence.

Communities which consider the impact the built environment has on health, such as walkability, clean air, healthy food systems, healthy housing and healthy transportation networks will do much to support the vision of healthy communities, healthy citizens.

3. Land Use

3.1 Land Use Mix



The Town of Paradise has a total land area of almost 3,000 ha. The figure to the left shows the breakdown of areas that have been designated in the Municipal Plan for different land uses.

As can be seen, the majority of lands within the Town are developed and/or designated for future residential development.

Rural lands and areas set aside for conservation or open space account for 736 ha or 25% of the total area. These lands are typically around parks and recreation areas like Octagon Pond, wetlands, areas of steep slopes and high elevations. Presently, most lands above the 190m contour elevation are identified as rural lands and open space lands due to servicing limitations established in the 1970s when the original regional servicing plan was developed. Since that time, further studies have indicated that development above the 190m contour elevation is possible and a policy that prevented development in these areas has been removed from the St. John’s Urban Region Regional Plan.

The Town has a good supply of industrial land that is quickly being developed as the regional economy has created demand for industrial sites and uses that service and supply the offshore oil industry.

Commercial lands, typically those along Topsail Road provide local services. Some lands are currently set aside for future commercial development to service residential development in the community.

Other lands include lands for mineral workings, mixed use, public use, and residential subdivision areas.

3.2 Residential Development

Growth in the residential sector in Paradise has been steady and almost continuous since the Town was incorporated (Figure 6). Between 1993 and 2003, an average of 165 building permits were issued annually. However, from 2003 to 2013 there has been an average of about 420 new dwelling units constructed each year.

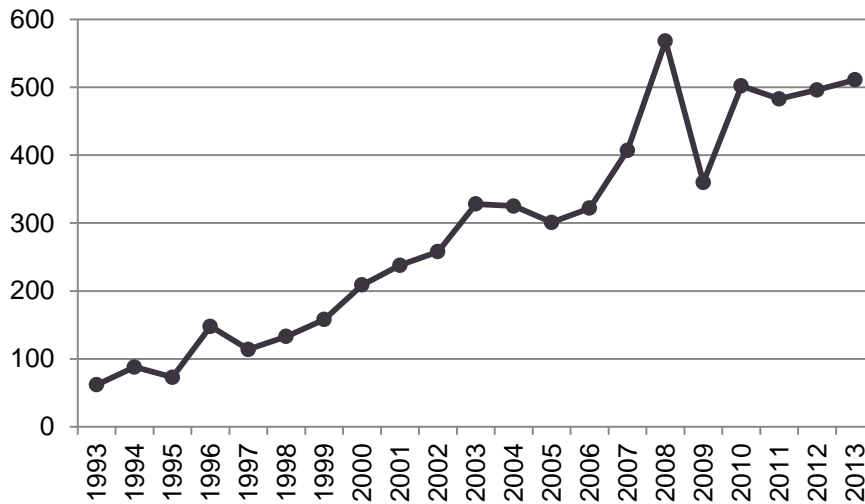


Figure 6. Building Statistics – Paradise (1993-2013)

The majority of residential development has been in the form of residential subdivision developments of predominantly single detached dwelling units. These have occurred as water and sewer servicing has extended off the main roads of Topsail Road, Paradise Road, and St. Thomas Line, particularly around Adam's Pond. The main residential areas are the former St. Thomas Town site, Elizabeth Park, Donovan Terrace, and Karwood Estates. New developments are currently approved for lands around Octagon Pond. Large lot residential areas have been developed at Topsail/ Three Island Pond and on the Bluffs, where municipal water and sewer services are not planned.

3.2.1 Residential Demand

Paradise has an estimated 7,650 residential dwellings. Assuming the average number of persons per household is 2.7, the estimated population in 2014 should be between 20,000 and 21,000 people. If current development trends continue and there is sustained demand for residential growth of 420

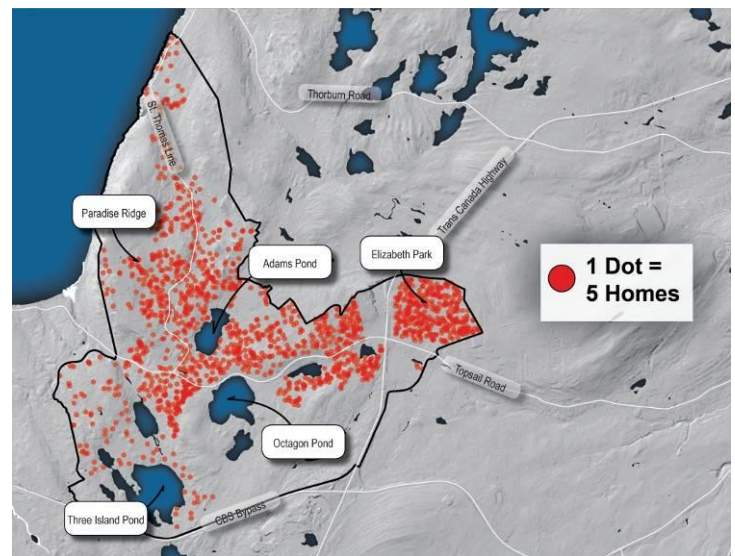


Figure 7. Residential Density.

dwellings per year over the 10 year planning period, an additional 4,200 dwelling units would be required in the community. Assuming the average household size remains the same (2.7), this demand would add an additional 11,340 people to the community bringing the total to approximately 32,000 people.



It is likely that this demand is overestimated as household size continues to fall and deaths from the growing number of elderly persons reaching their end of their lives continues to increase. At the same time, adjoining communities continue to approve new lands for development which will compete with Paradise for new residents.

However, it is likely that Paradise will continue to attract new residents as it improves its road network, develops quality recreational facilities and acquires a complete school feeder system within the community.

3.2.2 Residential Land Supply

As shown in the table below, there are currently approximately 900 residential building lots/units that have been approved for development in the town. Fully developed, they could accommodate an additional 2,400 persons, assuming the average household size remains the same.

Residential Land Supply	Number of Lots
Approved lots/units (approved or approved in principle)	900
Proposed lots/units (currently under review)	400
Potential lots in areas identified for future growth	3070
Total Lots	4370

There are also several planned developments that are currently in various stages of review that could add an additional 400 residential lots or units to the community. In areas identified for future growth, an additional 3,070 lots could potentially be developed bringing the total to approximately 4,370 dwellings or units.

Full build-out of these developments/areas will satisfy residential demands over the planning period and perhaps beyond without expansion into new areas. The main consideration to be addressed in the

Municipal Plan review is whether new areas should be opened up for development, in advance of completion of those areas that have already been approved or are under consideration.

3.2.3 Housing Stock

An important consideration for future development in the Town is the mix of housing types and whether the housing mix meets the demand. Paradise is fortunate in that it has a higher mix of housing types than most other suburban communities in the Northeast Avalon.

The majority of the housing stock consists of single-detached and duplex dwellings. As shown in Figure 8, the overall number of dwellings has increased from 2006 to 2011, but the ratio of housing types has remained about the same. While the demand for single detached dwellings is expected to remain strong, increasing demand for smaller dwelling units can be expected, considering the proportion of the population that will reach retirement age over the next decade.



The Town's Strategic Plan identifies housing affordability as an issue in the community and the need to improve access to affordable forms of housing for people such as seniors.

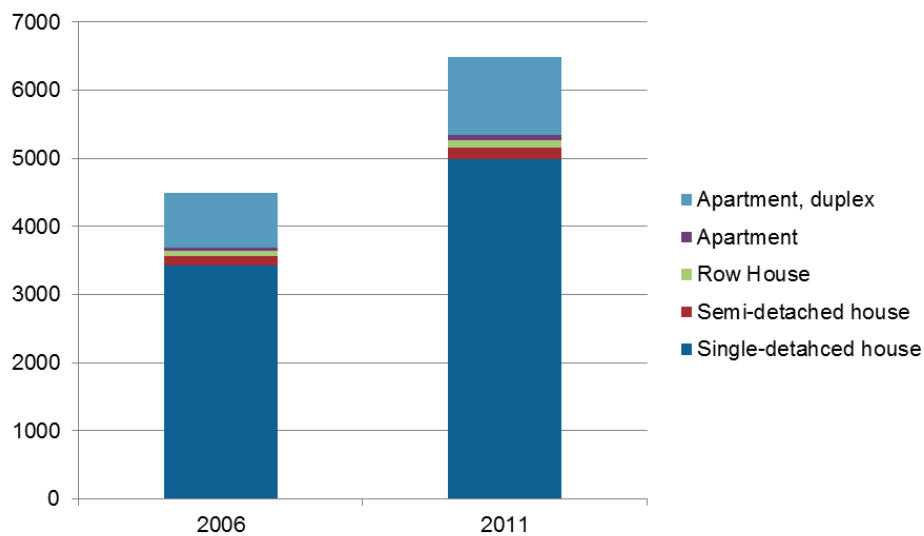


Figure 8. Dwelling Types – Paradise (2006 and 2011)

3.3 Commercial

Commercial development in Paradise is concentrated along Topsail Road - the Town's main street. To a lesser extent, commercial uses also exist along Paradise Road and St. Thomas Line. Most commercial uses are individual business and small shopping areas that cater to local needs.

The current Municipal Plan identifies a need to create a more focussed commercial Town Centre and identified the area at the intersection of Karwood Drive and Kenmount Road as the area to encourage and focus commercial development.



Neighbourhood commercial uses are needed near some residential areas to provide convenience goods and services. Consideration for incorporating these into developing areas in appropriate locations should be addressed in the Municipal Plan.

Within the Town's commercial areas, there are over 65 unique products or services offered including eating-places, beauty shops, legal services, grocery stores, and general automotive repair shops.

3.4 Industrial

There are about 157 hectares of industrial land in Paradise. St. Anne's Industrial Park is the oldest industrial park and has been fully occupied for some time. A second industrial area along Kenmount Road and McNamara Drive is undergoing continuous expansion including the Bremigen's Pond Industrial Park.

A proposal by Oceanex to develop an industrial site in the City of St. John's on the west side of the Manuels Access Road includes a proposal to create an interchange that would connect with an extension to Kenmount Road. This would improve access to the regional road network for industrial sites in Paradise.



Older former industrial sites such as the steel mill site, located east of Octagon Pond and south of Topsail Road, are being remediated and redeveloped as part of the recreational complex between the Community Centre and Octagon Pond. The current ACAN Windows building at the corner of Topsail Road and McNamara Drive has potential to be redeveloped for other uses, as this site is currently underutilized.

The quality of industrial areas could be improved by implementing urban design standards that would include landscaping on industrial sites, streetscaping, and environmental protection and amenities in these areas.

3.5 Recreational Open Space

Paradise is served by a number of trail systems including The Grand Concourse, the T'Railway, the East Coast Trail as well as the Octagon Pond Trail, Neil's Pond Trail, and the Elizabeth Park Walking Trail.

The Grand Concourse begins in St. John's and extends through the neighbouring municipalities of Mount Pearl and then Paradise. The Grand Concourse is currently a pedestrian-based trail but has potential as an off-road cycling route. The T'Railway walking system is the former railway bed and extends from the boundary with Conception Bay South to the boundary with Mount Pearl. The T'Railway is owned by the province and therefore not maintained by the Town. ATV users as well as bikes frequently use the T'Railway.



Open space, recreation, and public use areas play an important role in community development. They are important land uses that can result in personal, social, economic, and environmental benefits to individuals and the broader community.

Community recreation areas, both formal and informal, are located at various sites in the Town. Sports playing fields, basketball courts, and playgrounds are dispersed throughout residential areas of the Town. The main formal areas are at the Rotary Paradise Youth and Community Centre, Dianna Whalen Soccer Complex, Paradise Community Centre, the lighted softball field on Milton Road in the Donovan Terrace subdivision, and the minor soccer field at Peter Duff Memorial Park on Topsail Pond Road.



Peter Barry Duff Memorial Park consists of 30 acres of land located at Topsail Pond Road. The Duff family, in memory of their late son, donated the land to the Town. The park is unique in that one of the conditions of the transfer of the property to the town was that it be developed exclusively for the youth in the area. Since its initial construction in 1993, the park has grown from a wilderness area into a multifaceted recreation park with walking trails, a playground, and numerous sports facilities.

Octagon Pond and the area surrounding it remains the significant recreational area of the community. The Grand Concourse Authority maintains a trail network leading to and around the pond, and a significant Community Recreation Park is currently being developed behind the new arena on McNamara Drive. The park will include a splash park, wheelchair accessible playground, dog park, concession areas, trails, and have capacity to host events such as concerts and the annual Dragon Boat Festival and other boating events on the Pond.

Connecting residential areas to recreational open spaces and facilities will encourage active living among residents. Continued attention to ensuring access to existing and new neighbourhood parks and open spaces will be needed to ensure quality, healthy neighbourhoods.

3.6 Schools

There are currently three elementary schools in Paradise - Elizabeth Park Elementary, Paradise Elementary, and Holy Family School. A fourth school is planned on a site just west of Octagon Pond and the Eastern School District has recently indicated it is in the planning stages for a High School and a Junior High School.



The addition of a High School would enable students in Paradise to complete school from Kindergarten to Level III within the community. The location of a high school should be carefully considered so that it can be developed on a site that it maximizes benefits to the community and the students who will attend.

3.7 Rural Resource Uses

Rural resource uses in the Town are limited to one long-standing quarry operation. The City Sand and Gravel Ltd. quarry off Topsail Road has operated in the Town for several decades and is the only designated aggregate resource area in the Town. The quarry is nearing the end of its available aggregate resource and quarry operators estimate that within 7-10 years the resource will be exhausted. At that point, the area could be redeveloped for other uses.



A 300m separation buffer between the quarry and adjoining residential areas has been in place for many years. To extract the remaining aggregate, the operators have requested a reduction of the buffer to 200m. Improved mining technology and directional blasting enable quarry operators to control the impacts of blasting operations so as to reduce risk to adjoining areas. The Department of Natural Resources has indicated support for this reduction.

Balancing the need for aggregate resources to support continued growth and development and protection of adjoining land uses will require consideration in the Municipal Plan.

4. Physical and Natural Environment

4.1 Elevation

Paradise has a rolling and varied topography (Figure 9). Within the Town, elevations reach as high as 280m with a topography characterized by steep banks and ridges. Residential development has worked its way up the slope of some of these areas such as Paradise Ridge.

Approximately 210 hectares of land lie above the 190m contour elevation. Development in these areas must be carefully considered to ensure that adequate downstream capacity exists within existing wastewater and stormwater systems to accommodate development and that water can be provided from the existing regional water supply at these higher elevations.

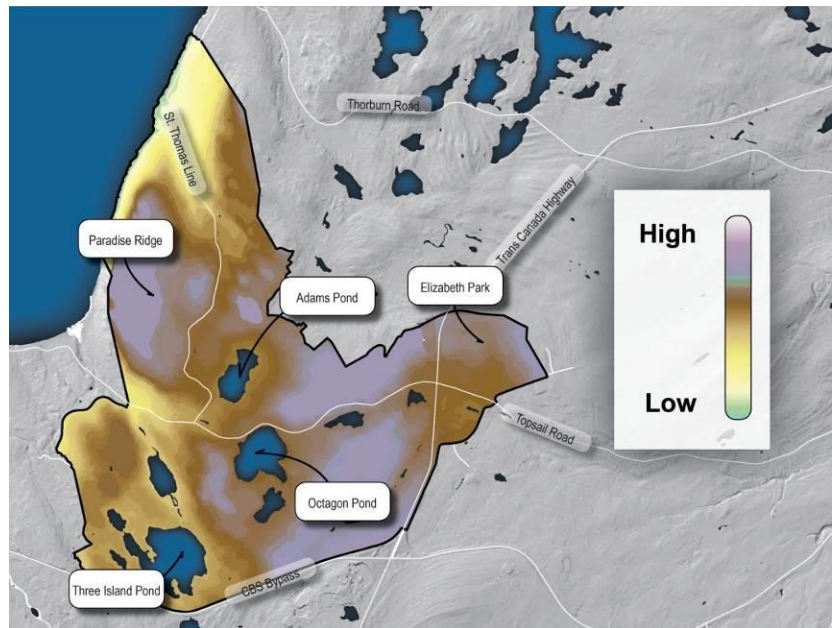


Figure 9. Elevation Map

4.2 Slope

Figure 10 shows the slope of land within the community. Steeper areas are along the coastline at the higher elevations such as at Paradise Ridge and in the northern section of St. Thomas Line. Slopes over 10% are relatively more expensive to build on, require more complicated foundations and utility connections.

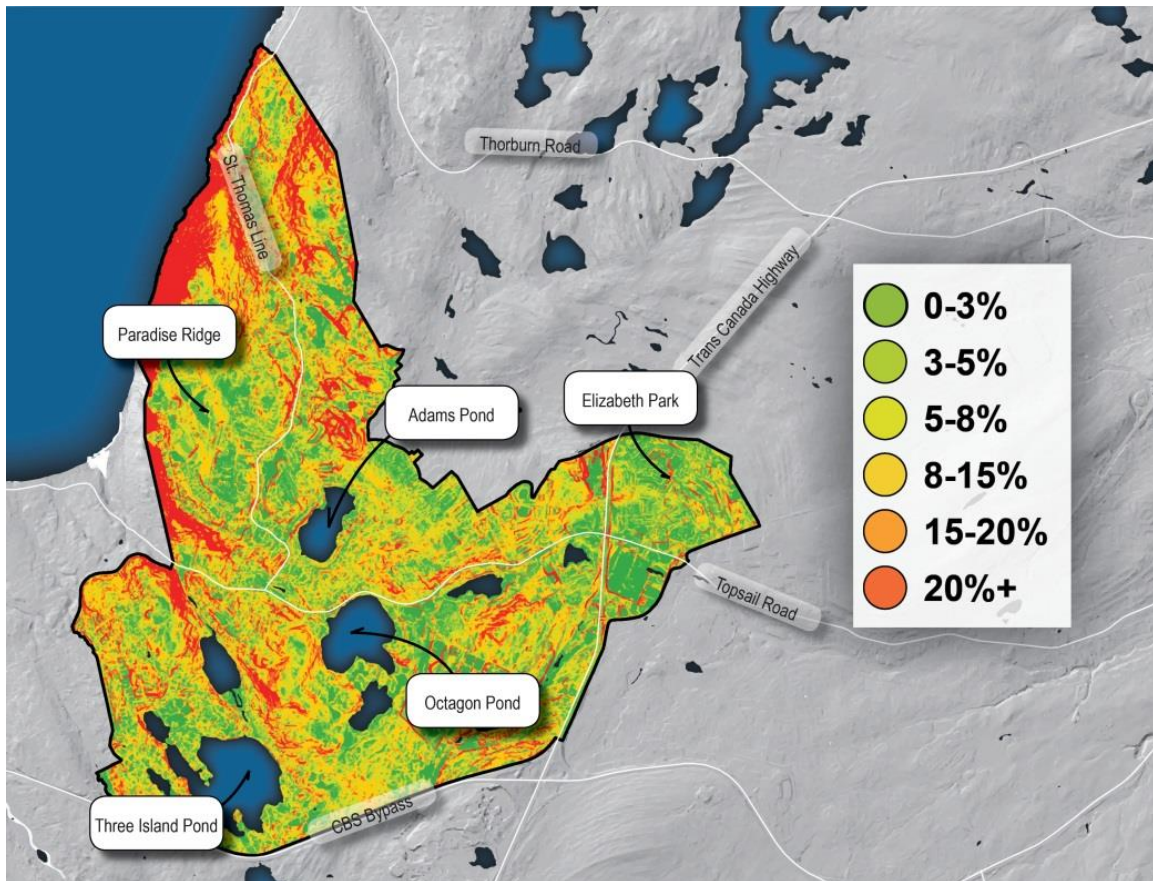


Figure 10. Slope Map (Percentage)

Managing development in areas of steep topography requires attention to cut and fill, street orientation and stormwater management.

4.3 Waterways and Wetlands

The 2004 Municipal Plan identifies lands for conservation that are environmentally sensitive, vulnerable, or ecologically significant. They include wetlands, watercourses, bodies of water, shoreline frontages, and a portion of the East Coast Trail along the shoreline of Conception Bay. The Conservation designation is used around Adam's, Octagon, Rocky, Topsail, Three Island, Neil's, Brazil, and Bremigen's Ponds, as well as the Topsail River, Horse Cove Brook, and other streams and their associated wetlands. The conservation buffer established around ponds is 30 metres from the shoreline, while along watercourses the conservation buffer is, consistent with provincial environmental policy, a distance of 15 metres from the stream.

The Conservation area around Topsail Pond extends beyond 30 metres of the shoreline in some areas to prevent pollution problems in the pond caused by malfunctioning on-site sanitary sewage disposal systems.

Bremigen's Pond and the waters draining into it are the headlands for the Waterford River. Currently, there is a Memorandum of Understanding (MoU) in place between the Town and the Cities of Mount Pearl and St. John's that commits each party to the protection and enhancement of the Waterford River.

As more and more development occurs in the community, ponds, waterways and their associated wetlands, and the natural amenity they provide to a community becomes more and more important. Consideration for restoring the ecological connectivity of waterways and wetlands should be addressed in the Municipal Plan.



Paradise has over 24 km of lakeshore designated for conservation.

4.4 Climate Change

The interaction between aspect, slope, and relief can influence microclimate conditions. Development that faces south tends to receive the most sunlight while the north facing sloped areas experience the least sunlight. Figures 11 and 12 show slope aspect and sunlight intensity respectively.

While, the earth's climate has naturally changed over time, current concerns about climate change are focused less on the natural process, but on how human activity is contributing to climate change impacts. Climate change influences sea level rise, coastal zone erosion, extreme weather events, and terrestrial and marine ecosystems. Sea level rise and coastal erosion may not pose significant risks to Paradise as there are few low lying coastal



areas. However, it will be important to be aware of, monitor coastal change over time, and manage land use along the coastline.

Extreme weather events (such as hurricanes) and thermal extremes (like heat waves) pose the greatest hazard risks. Planning in the context of climate change requires that Paradise be proactive in planning for future development, infrastructure, and vital community services with risk reduction in mind.

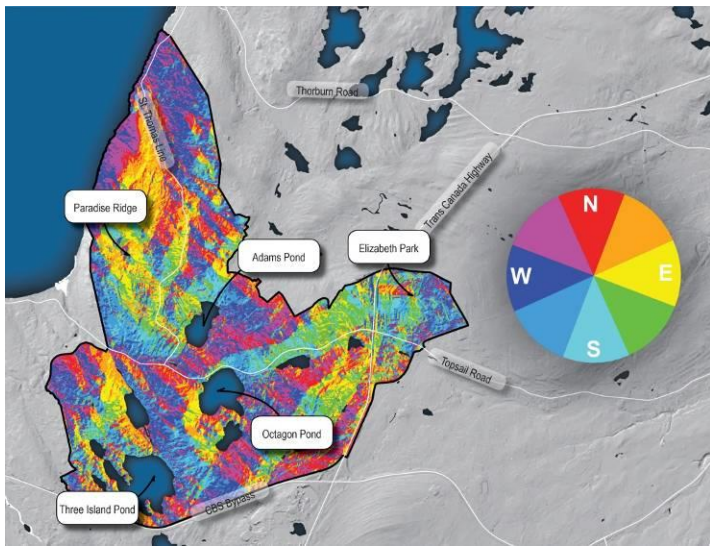


Figure 11. Aspect

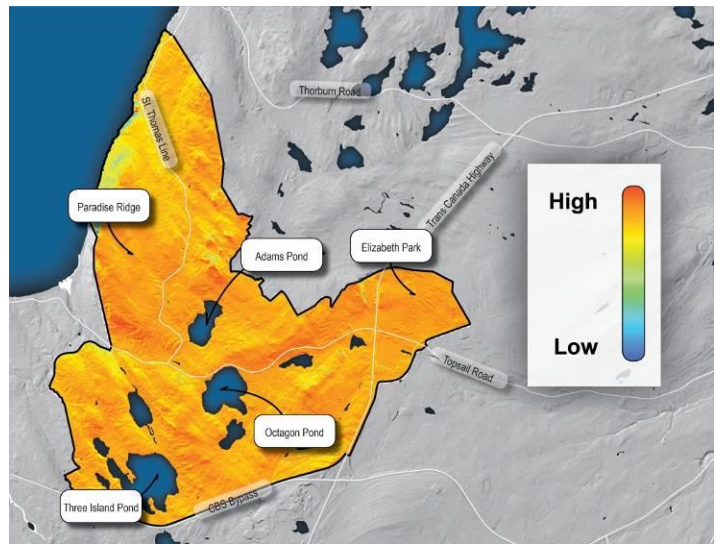


Figure 12. Sunlight

5. Transportation

5.1 Commuting Patterns

Almost 75% of workers from Paradise commute to St. John's with another 15% commuting to the City of Mount Pearl. In Figure 13, the numbers indicate how many people work in each of the neighbouring towns and cities.

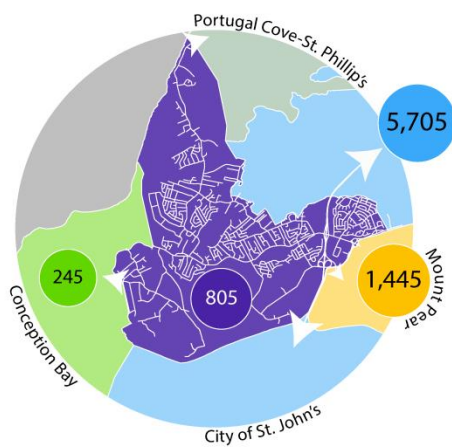


Figure 13. Place of Employment – Paradise (2011)

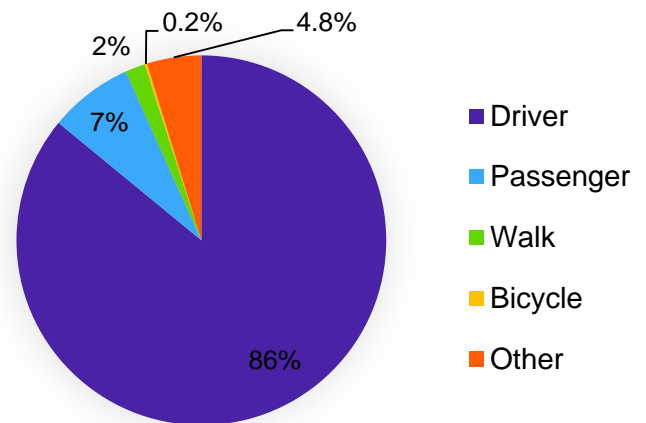


Figure 14. Mode of Travel – Paradise (2011)

Figure 14 shows the ways that people travel to and from work. Most commuters drive alone (86%) with only 7% travelling as a passenger in a vehicle. The use of active transportation (walking and cycling) for commuting is very low (about 2%).

There is currently no public bus service in Paradise. In the past, the Town has investigated the potential for acquiring a Public Transit Service. As the community grows, densities could become sufficient to support a transit system.

5.2 Road Network

With the majority of daily commuters from the Town heading to St. John's or Mount Pearl, traffic from residential neighbourhoods empties out onto Topsail Road, which is the main thoroughfare in the Town providing access to the Outer Ring Road and Kenmount Road. Another option for motorists to access the Outer Ring Road was added with the connection of Karwood and McNamara Drives with Kenmount Road.

To the south of Topsail Road, traffic enters directly to Topsail Road or via McNamara or Karwood Drives. To the north of Topsail Road, traffic flows through an extensive network of local residential streets onto two main collector streets – Paradise Road and St. Thomas Line – two of the oldest streets in the community. Traffic from Elizabeth Park area has a direct access to Kenmount Road.

Two other routes into and out of the community are via Topsail Road westward to Conception Bay South, or north to Portugal Cove-St. Phillips via St. Thomas Line.

Altogether, there are 153km of streets within the boundaries of the Town, 98% of which are owned and maintained by the Town.



Figure 15. Street Network

5.3 Transportation Planning

In recent years, it has become apparent that growth in the community was surpassing the ability of the street network to handle the additional traffic loads on the main thoroughfares, particularly Topsail Road and the exits to Kenmount Road along Karwood Drive.

A traffic study in 2011 and subsequent Transportation Plan in 2014 identified a number of short, medium, and long-term improvements for the Town to implement to increase capacity, and improve efficiency and safety of the street network as shown in Figure 16. Many of the short-term recommendations have or are being implemented, including street widening and placement of traffic signals on Karwood Drive, widening sections of Topsail Road, and optimizing traffic signaling. The construction of a traffic roundabout at the intersection of Karwood Drive and Kenmount Road in 2014 improved traffic flow in that area.

Other aspects of the Plan include proposals for a roadway connection with the Manuals Access Road by extension of Kenmount Road, and additional roadways in the long-term to provide new connections to the Outer Ring Road and north to Portugal Cove-St. Phillips.

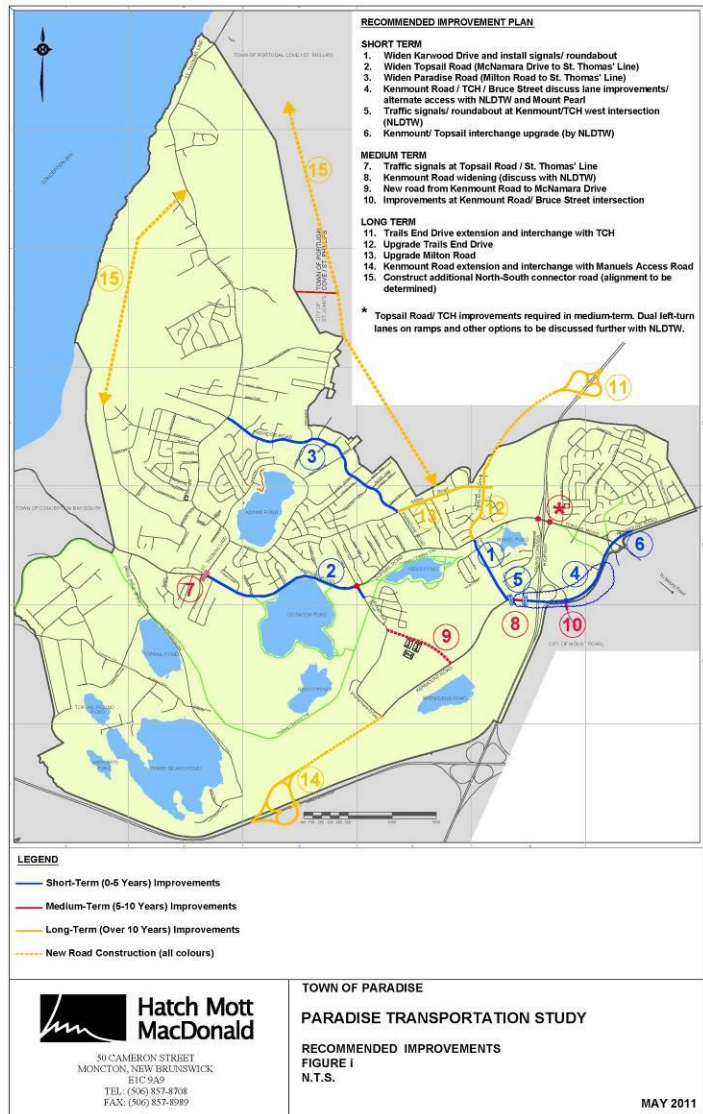


Figure 16. Traffic Study Map with Recommended Improvements

The Transportation Plan also recommended that development in some areas should not proceed ahead of planned street improvements/connections. The challenge for the Town is to ensure that development takes place in a manner that is coordinated with improvements to the street network so that traffic congestion can be avoided in the future.

5.4 Active Transportation (AT) Network

The bulk of the existing pedestrian trail network in Paradise is located south of Topsail Road. The provincial T’Railway Park constitutes the main spine of the system, supplemented by connecting trails around Octagon Pond and Neil’s Pond. The Town is also served by The Grand Concourse, which extends from St. John’s, through Mount Pearl, and into Paradise, acting as the western “bookend” of the system.

The trails provide access to leisure destinations, schools, parks, scenic areas, playgrounds, and residential neighbourhoods.

In 2011, the Town prepared an Active Transportation Plan that recommended expanding the pedestrian network to include sidewalks and safe crossings along Topsail Road and the main collectors north of Topsail Road, including through Elizabeth Park. The Plan also recommended establishing a pedestrian network around Adams Pond, which the Town has since initiated.

While the Active Transportation Plan recommended provisions for cycling, there is currently only one small section of marked bicycle lane on McNamara Road.

A portion of the East Coast Trail passes through the community along the coastline in the northern area of the Town between Topsail Beach in Conception Bay South and St. Thomas Line.

The Town’s Strategic Plan commits Council to continued development of the trail system to connect neighbourhoods to recreational areas, schools and commercial areas.

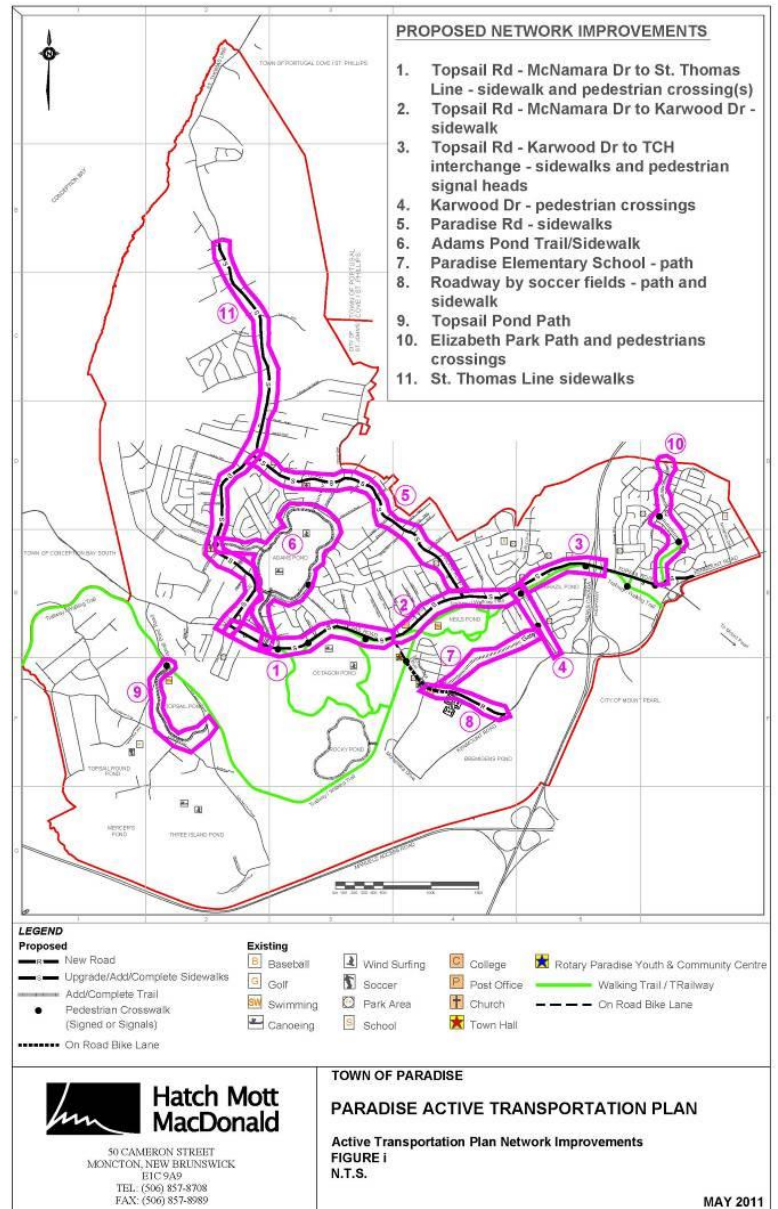


Figure 17. Paradise Active Transportation Plan, 2011



5.5 Connectivity

One of the greatest issues facing the Town from a transportation perspective is lack of connectivity, whether it is between residential developments or major roadways. Connectivity refers to the density of connections in the path or road network and the directness of links. A well-connected road or pedestrian network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, creating a more accessible and flexible system. Connectivity can apply both internally (streets within a neighbourhood) and externally (connections with arterials and to other neighbourhoods) (Litman, 2011).



Paradise has a connectivity index, calculated by dividing the total number of street segments (street lengths between intersections) by the number of streets nodes (intersections/dead-ends), of 1.3. A score of 1.4 is the suggested minimum needed for a walkable community

While the Town, through its development review process, has been able to ensure that streets in new developments provide access to collector streets, they have also worked to increase the connectivity of street networks within and between subdivision developments. There is an opportunity to strengthen policies of the Plan to ensure that connectivity of streets, sidewalks, and pedestrian pathways continues to be a priority in new developments.

6. Municipal Services

6.1 Water and Sewer

The Town is supplied with gravity water flow from Bay Bulls Big Pond via the St. John's Regional Water System. A booster station on Topsail Road pumps water up Paradise Hill. The Town's sanitary sewer mains drain by gravity into the Waterford Valley Relief Trunk Sewer and a new trunk sewer to a treatment plant at on St. Thomas Line.

Serviced areas are located in the central and eastern parts of the Town, along Topsail Road, Paradise Road, and St. Thomas Line. The remainder of the Town is serviced by individual wells and on-site septic tanks/disposal fields. There are no services provided in the Topsail Pond/Three Island Pond area.



A number of areas of the Town have distinct servicing issues that need to be considered in future planning and development. Gravity supply water service is limited to areas below the 190-meter contour due to the top water level of the supply tank (approximately 17 meters). These difficult to service areas include the St. Thomas area, the Adam's Pond area, Topsail Pond/Three Island Pond, the Octagon Business Park, and areas above the 190-metre contour north of Topsail Road. With the growth Paradise has experienced and is expecting, continued upgrades and expansion of municipal services will be a high priority.

6.2 Stormwater

As the Town has grown, the increased area of hard surfaces such as rooftops, streets, and parking areas contributes to an increase in storm water runoff. In 2013, the Town prepared a Storm Water Master Plan. Background research for the Plan identified that a significant proportion of drainage structures in the Town were undersized and unable to meet the needs of existing and future development.



The Stormwater Master Plan identifies three main drainage basins as shown in Figure 18. Basin A includes Three Island, Topsail, Octagon, Neils, and Adams Ponds, as well as all their tributaries and associated catchment areas. This drainage basin drains to Conception Bay via the Topsail River. Drainage Basin B includes Bremigen's and Brazil Ponds, Elizabeth Park and all associated tributaries and catchments, which drain to the Waterford River. Drainage Basin C includes all tributaries and catchments for Horse Cove Brook, which drains into Conception Bay and was identified as the area where most of the improvements in stormwater infrastructure were needed.

The Plan identified a program of upgrades to improve the stormwater management system and the Town has begun to implement the recommendations.

The Stormwater Management Plan also includes recommendations for land management to reduce the impact of development on the stormwater system. These include limiting encroachment of development along watercourses, including implementation of a 30m, no-development buffer, to be maintained around all streams, ponds, and associated flood zones. The Plan also recommended existing wetlands be preserved.

Also included was a recommendation for a policy that would require zero net increase in peak run off from new development. Such a policy would require developers to be responsible for handling stormwater within development sites so that peak runoff would not exceed pre-development conditions.

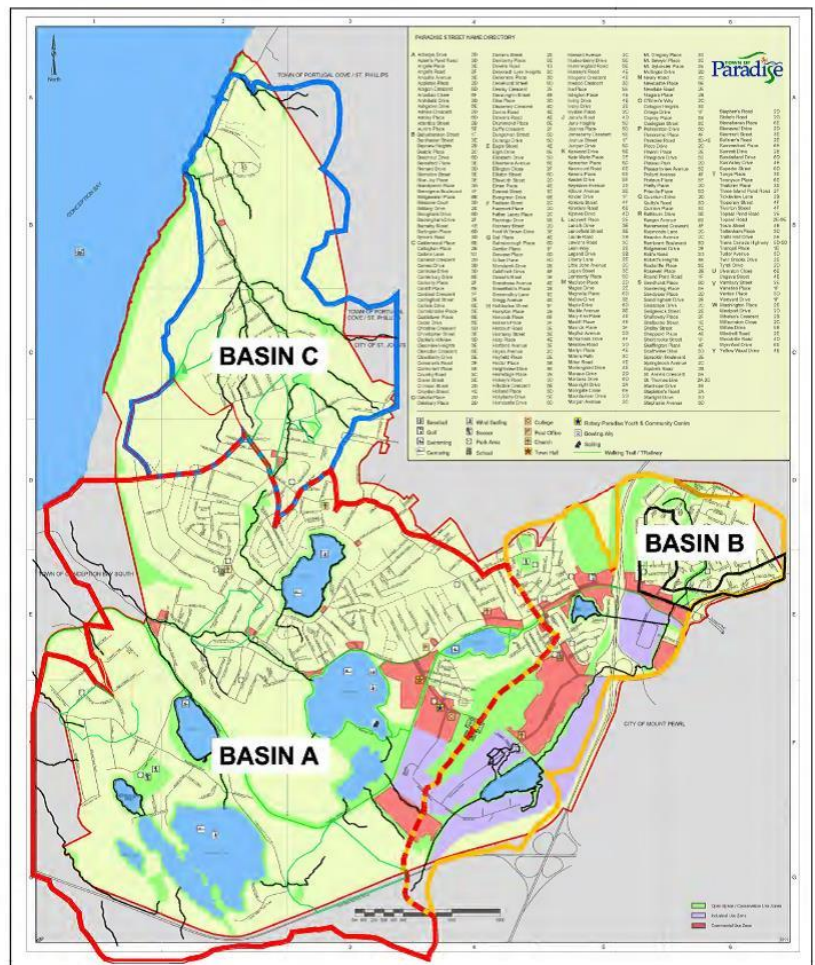


Figure 18. Stormwater Management Plan, 2013.
Source: BAE-Newplan Group Limited

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