

# LOWER MAKEFIELD TOWNSHIP BUCKS COUNTY, PENNSYLVANIA TOWNSHIP RECREATION ASSESSMENT

October 19, 2018





# Lower Makefield Township

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## Executive Summary

Lower Makefield Township, located in Bucks County, Pennsylvania, offers significant open space and recreation opportunities to its residents and visitors, with more than 580 acres in 14 separate park facilities owned and operated by the Township. Each facility was designed for active, passive, or mixed use. Local sports organizations have been identified as common users of the recreation facilities designed for active use. Lower Makefield Township, in conjunction with the Bucks County Planning Commission, is conducting an inventory and needs assessment of the existing recreation facilities currently owned and operated by the Township.

The BCPC's objective perspective will assist the Township in understanding current use and determine if there is a need to construct additional recreational facilities. In order to do so, this study assessed the demographic trends of Lower Makefield Township, compared the current Township and Pennsbury School District facility inventory to NRPA standards and recommendations, and administered a user matrix to the potential user groups of the Township's recreational facilities. The user matrix was used to gather pertinent details from the user groups including participation rates, Township participants, total hours of use per field, and the extent of scheduling issues for in demand fields.

Demographically, Lower Makefield Township is consistent with regional trends. The total population growth from 1990 to 2000 was over 30 percent but has since plateaued, with estimates projecting little growth from 2018 to 2025. Additionally, the Township's population is steadily aging, the median household value is regionally high, and the population of youth is slowly declining. These demographic indicators may suggest that young families face barriers to entry with regards to residency in the Township.

The Township's inventory of parks and recreation facilities exceeds the NRPA recommendations in acreage but is deficient in its number of parks and certain facility types. In conjunction with the Pennsbury School District facilities there are quantitatively enough facilities in the Township to satisfy the population. However, the distribution of the facilities is skewed in favor of certain sports leaving other sport organizations without a dedicated field or facility to consistently use. This pattern was evident in user matrix responses. The lacrosse, field hockey, ultimate frisbee, and rugby user groups reported that they face repeated scheduling issues and are not able to use Township multi-purpose fields. Macclesfield Park is the largest and only facility with a synthetic turf field. The reservation of the park's fields is a commodity sought after by multiple user groups year round. Due to the over use of most of the park's fields, the fields have deteriorated and rarely have an off season to rest and regenerate.

Additional field space would alleviate the overuse and scheduling issues of the fields at Macclesfield Park. A synthetic turf field installed in the Township would provide a space for the user groups who struggle to find a facility to consistently use. Based on the analysis of the demographic data as well as the user matrices, it is clear that additional field space is warranted. The BCPC recommends that the Township consider the development of at least one additional

multi-purpose flat field. Furthermore to service the greatest number of users and offset the need for increased maintenance, the use of synthetic turf should be given high priority.

This study synthesizes the responses of potential user groups and does not take into account the perspective of the passive, self-directed user. The BCPC recommends that Lower Makefield Township conduct a statistically valid Township wide survey to accurately document all resident wants and needs relative to parks and recreation.

## Background

The availability of athletic fields and facilities to the public is a key element to establishing and maintaining a sense of community in a municipality.<sup>11</sup> In a municipality with a physically active population, the demand for pristine facilities is of great importance. In Lower Makefield Township, the use of the available fields and facilities by the public, resident sport organizations, and non-resident sports organizations has led to a discussion on whether additional fields and facilities are warranted.

Lower Makefield Township is located in southeastern Bucks County along the Delaware River. It shares borders with Upper Makefield, Newtown, Middletown, and Falls townships, as well as Yardley and Morrisville boroughs. Lower Makefield Township is nearly 18 square miles, or 11,456 acres, in land area. US Route 1 and the 295 highway intersect Lower Makefield, increasing the ease of access to and from the municipality to locations of economic vitality, such as Philadelphia and New York City. Lower Makefield Township houses over 33,000 residents in over 12,000 housing units. The municipality provides 587.63 acres of parkland in 14 recreational facilities available to the public, ranging from pocket parks and tot lots to the nearly 100-acre Macclesfield Park. The list of Township owned facilities is provided in figure 1. This study does not include the Makefield Highlands golf course.

Figure 1

Name of Facility	Lot Size (Acres)
Community Park	25
Stoddart Fields	5.7
Greg Caiola Baseball Complex/Community Center	26
Fred Allan Softball Complex	22.75
Macclesfield Park	94.7
Memorial Park	63.5
Veteran's Square Park	2.87
Heacock Meadows Facilities	4.5
Makefield Glen/Dog Park	3.7
Peake Farm	1.69
Yardley Hunt/Schuyler Road	1.49
Yardley Hunt/ Revere Road	1.53
Snipes Tract	36.2
Five Mile Woods	298
Total	587.63

As stated in the Township's comprehensive plan draft, the Township's primary goal for all future parks and recreation planning is to provide adequate parkland to meet the needs of the Township based on complete build-out of the community. Population projections done for the 1992 master comprehensive plan anticipated an ultimate build-out population of 42,000. In 2018, the Township's population is estimated to be 33,108 persons. Based on this data, the current build-out of the community is 78.8%. The 2005 comprehensive plan and the 2015 comprehensive plan draft detail a number of factors that have combined to contain the ultimate build-out of the community. They include growth management and open preservation measures taken by the Township, as well as broader trends resulting in an aging population and regional population loss. Furthermore, the master plan draft states that future parks and recreation planning should provide a balance of active and passive recreation facilities to meet the needs of citizens of all ages and interests.<sup>1</sup>

To accomplish these goals, Lower Makefield Township, in conjunction with the Bucks County Planning Commission, conducted an inventory and needs assessment of the existing recreation facilities currently owned, managed, and used by the Township, Pennsbury School District, and other local athletic organizations. Input from sports user groups as identified and provided by the Township was also included in this report and subsequent analysis.

## Literature

The World Health Organization recommends that youth between the ages of 5 and 17 should accumulate at least 60 minutes of moderate to vigorous-intensity daily physical activity.<sup>8</sup> However, the majority of children and adolescents do not achieve 60 minutes of moderate to vigorous-intensity daily physical activity.<sup>6,7,9,10</sup> A US television study conducted by the Kaiser Family Foundation found that youth ages 8-18 had a 13.5 percent decrease in television time from 1999-2009, but had an increase of 18.5 percent increase in other screen activities due to laptops, tablets, and mobile phones being more accessible.<sup>6</sup> Additionally, video game usage increased by 49 percent between 2004 and 2009.<sup>6</sup>

School is the most common medium for delivering educational messages and curricula intended to reduce screen time at home.<sup>6</sup> Such interventions are proven effective but do not specify which activities should replace sedentary time.<sup>6</sup> Neighborhoods, parks, and schools can help children reduce sedentary time by providing safe, convenient, and appealing places to walk, bike, and play.<sup>6</sup> Children are more likely to be physically active in neighborhoods that are perceived to be safe, have sidewalks, and destinations such as parks, schools, and shops within walking distance.<sup>6</sup> Being able to walk or bike to a given destination, instead of drive, can reduce sedentary time by up to 26 percent.<sup>6</sup> Due to changes in temperature and energy exertion, time spent outdoors allows opportunity for more calories to be burned.<sup>9</sup> Access to safe parks, programs, and facilities, including ball fields, trails, and playgrounds have been proven to help and encourage youths to be more physically active.<sup>6</sup>

Recent studies have also backed up what is thought to be common sense, being that children and adolescents with easy access to recreational facilities are more active than those without easy access.<sup>9</sup> This is found to be especially true for toddlers and their proximity to playgrounds and adolescents and their proximity to larger recreational facilities.<sup>9</sup> A 2003 study found that less than half of American children have a playground within walking distance from home and 61 percent of parents say the lack of walkable facilities is the barrier to their kids spending time outside.<sup>9</sup> Creating and improving recreational spaces can spark a twenty five percent increase in those who exercise at least three times per week.<sup>9</sup> The closer individuals reside to a trail, bikeway, park, or recreational facility, the more likely they are to use it.<sup>9</sup>

## Methodology

The scope of the analysis includes the Township's demographic makeup, trends of the community and the culture of the current uses of the recreational facilities. From the years 1990 to 2025 demographic data detailing total population, growth rate, median age, total housing units, and median household value was compiled and analyzed. To ensure the legitimacy of the analysis of Lower Makefield's demographic makeup, identical data was collected and analyzed for other municipalities that share similar geographic features.<sup>4</sup>

The 2011 *Bucks County Comprehensive Plan* designates Lower Makefield Township as one of the municipalities in an "Emerging Suburban Area" category, meaning the Township has experienced significant development in the last twenty years and is intended to accommodate future development.<sup>4</sup> As an Emerging Suburban Area, the plan recommends that new development should be compact and built where existing infrastructure is adequate and development should be catered toward pedestrians. Both Northampton Township and Warrington Township are categorized as Emerging Suburban Areas and, alongside Falls, Middletown, and Newtown Townships, are the municipalities that were selected to compare demographically with Lower Makefield. The aforementioned townships share similar geospatial traits with Lower Makefield, including regional location, square mileage, and population size.

Each field and facility in Lower Makefield Township was inventoried. Data was gathered on the facility or field's acreage, usable park area, number of parking spaces, and what recreational or sport facilities are located on each given site. Three elementary schools and a middle school complex that are part of the Pennsbury School District were included in the analysis. The data regarding the 36-acre Snipes Athletic Fields is a placeholder, as plans to construct the tract have not come to fruition, although detailed designs of the tract have been completed. Data regarding the Snipes Tract has been included in this study due to the intent of the Township to further contemplate field construction, as stated in the *Township of Lower Makefield Comprehensive Master Plan Update 2015 draft*- "The Snipes Tract, a 33-acre tract at Quarry and Dolington roads, is a planned park and recreation site including athletic fields, a tot play area, a skate park, covered pavilions, and bike path connections along Quarry and Dolington roads."<sup>1</sup>

## Data Collection

The *Township of Lower Makefield Comprehensive Master Plan Update 2015 draft* defines “recreation” as “a healthy and enjoyable activity, whether indoors or outdoors, in which individuals or groups engage in during their leisure time”.<sup>1</sup> The draft defines “Parks, Recreation, and Protected Open Spaces” as “Municipal, County, and State parks, State Game Lands, County preserved land and flood control sites, golf courses, scout camps, and campgrounds. Includes land preserved by conservation organizations and deed-restricted land or common open space areas associated with residential developments”.<sup>1</sup>

All of the statistical data collected for the analysis was produced by the US Census. The nature of the report required general census data, specific demographic data, and demographic projection data. Various resources were consulted to assemble the required information. The National Historic Geographic Information Systems (NHGIS) proved a valuable source for collecting the necessary historic census data. The NHGIS provided the demographic data needed from the 1990, 2000, and 2010 US Census.

The Delaware Valley Regional Planning Commission is the federally designated Metropolitan Planning Organization that serves the nine-county Greater Philadelphia region, including Bucks County<sup>16</sup>. The DVRPC projects population data to 2045 that are based on DVRPC produced 2015 census estimates. The projections focus on total population data and do not include other pertinent, granular demographic analysis. The DVRPC data was consulted but was ultimately deemed insufficient for the basis of the analysis due to the lack of a wide array of granular demographic information.

ESRI is the creator of the ArcMap software and global market leader in geographic information systems.<sup>13</sup> ESRI’s databases and mapping programs provide greater insight and contextual analysis to researchers studying a multitude of material, including detailed demographic and population data. ESRI incorporates a full time series of intercensal and vintage based county estimates from the US Census Bureau. ESRI revises its forecasts annually to use the latest and most accurate data to represent the unknown in an informed manner. The forecasts include current year estimates and five year projections. By creating a matrix of data from several sources, various demographic information can be projected. The five year projections are necessarily derived from current events and past trends. Future data series must be extrapolated from this knowledge. ESRI data is updated annually and is comprised of data from numerous reliable sources<sup>13</sup>. Based on this criteria, ESRI’s five year projections from 2018 to 2023 were adopted as the basis for this study and ESRI data was used to fill any gaps in the data collection. Between the NHGIS and ESRI, all necessary demographic data was collected for the years 1990, 2000, 2010, 2018, and 2023.

## Formulas

The scope of the research requires demographic data to be collected and evaluated from 2015 to 2025. Regional data was gathered from 1990 to 2023 from reliable sources in order to better comprehend larger demographic patterns. Granular demographic data sets were found for the 2018 to 2023 five year projection, although no granular data was found for the 2023 to 2025 projection. In order to extend the 2023 projections to 2025, a developed BCPC population projection formula and an existing growth rate formula were used. Both of these formulas were based on and incorporate the ESRI five year projection data. The developed population projection formula does not reflect exact population numbers for 2025 as no projection will be exact. The developed formula does not take fertility, mortality, domestic or international migration rates into account. The population projection formula is solely derived from the NHGIS census data and ESRI calculated estimates and projections.

The population projection formula calculates the average number of persons who moved to a given municipality each year, between 2010 and 2018 (y). That number is multiplied by five, the amount of years between the 2018 and 2023 estimates, and added to the 2018 population. This generates a new estimate for the 2023 population. The average number (y) is multiplied by two, for each year between 2023 and 2025, and added to the new 2023 population estimate. The result is a population projection for 2025:

$$P_{18} - P_{10} = x \quad x/8 = y \quad P_{18} + (y * 5) = P_{23} \quad P_{23} + (y * 2) = P_{25}$$

A margin of error formula was developed for the produced population projection data. As previously stated, projection estimates cannot produce exact numbers, only educated estimates. The developed population projection formula yields a new population estimate for all eighteen municipalities in 2023. To find the margin of error, the 2023 new estimates (y) and ESRI estimates (x) for each municipality were totaled. The difference in the totaled estimates, in this case being 1292 persons, is divided by the number of analyzed municipalities, being 18. The resulting number, 71.8 persons, reflects the overall margin of error between the population projection formula estimates and the ESRI population for the year 2023.

$$ESRI \text{ population estimate for each municipality, totaled} = x$$

$$Formula \text{ generated population estimate for each municipality, totaled} = y$$

$$x - y = Total \text{ Difference} \quad Total \text{ Difference} / Number \text{ of Municipalities} = Margin \text{ of Error}$$

The formula used to determine the population growth rate was also used to determine other growth projections, such as median age and number of housing units. The formula subtracts the present population by the past population cohort. The total is then divided by the past population and multiplied by 100. The final number is the given rate of growth:

$$[(P_{Present} - P_{Past}) / P_{Past}] \times 100 = Growth \text{ Rate}$$



## Demographic Analysis

According to the *Township of Lower Makefield Comprehensive Master Plan Update 2015 draft*, the Township's population has more than doubled since 1970. The peak growth years in the Township were between 1980 and 2000.<sup>1</sup> Growth eventually leveled off between 2000 and 2010 and the population declined by about 0.5 percent (122 individuals).<sup>1</sup> During this time interval, the four Pennsbury School District municipalities, Lower Makefield, Falls, Tullytown, and Yardley townships, also experienced decreases in population.<sup>1</sup> The following figures provide an overview of the detailed age population and forecast of Lower Makefield Township from 1990 to 2025. The data in each of the following figures is from the NHGIS, ESRI, and the developed projection formula.

The demographic framework of the Township was the necessary starting point of the analysis. The demographic analysis determined that Lower Makefield Township, within the last thirty years, experienced a high increase of population, housing units, and overall growth. However, in the past few years the growth has leveled off. The overall population is projected to experience little change in the next decade. This is a regional trend and Lower Makefield is following the status quo of regional demographic patterns. The Township's population is aging, the housing units are maintaining high value, and the population of youth under eighteen is projected to remain relatively constant with a small forecasted decrease. This information sheds light onto who is moving into and residing in Lower Makefield. The median household value is one of the highest in the region, creating a high threshold of income needed to move into the municipality. Due to high household value, a decline in the population of youths, and an increasing median age, it is inferred that young couples and families may have been deterred and/or are unable to move to or reside in Lower Makefield Township.

## POPULATION

- Population in 2000 was 32,681
- Population in 2025 projected to be 33,484
- Growth rate between 1990 and 2000 was 30.3%
- Growth rate between 2000 and 2025 estimated to be 2.8%
- Median age between 1990 and 2025 projected to increase by 9.5 years from 36.5 to 46 years old
- Overall, population is expected to experience little change in the coming decade

Figure 2 shows the fluctuation in the Township’s population. Lower Makefield experienced rapid growth in the 1980s and 1990s<sup>1</sup>. Lower Makefield’s population significantly increased in the 1990s but has failed to undergo any following substantial change. As shown in figure 3 the growth rate from 1990 to 2000 was 30.3 percent and from 2000 to 2010, the population plateaued and experienced a period devoid of substantial growth. By 2018, the Township experienced a minor population increase, but is predicted to lose momentum and undergo little change in total population. The anticipated growth rate from 2023 and 2025 is .07 percent or 24 residents.

Figure 2

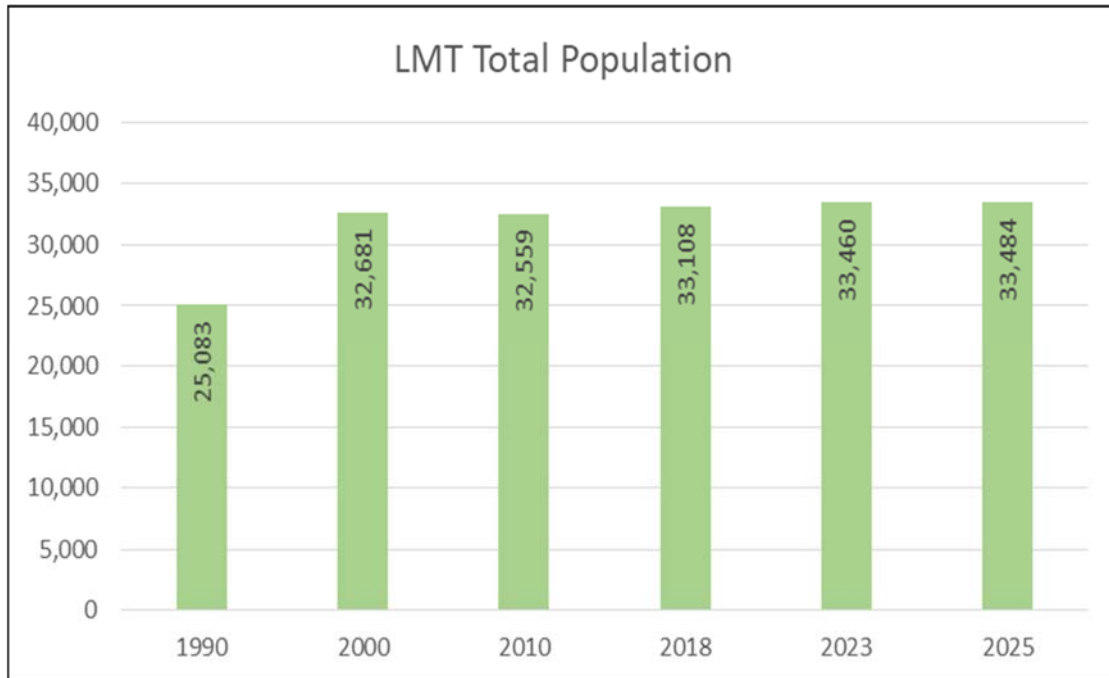
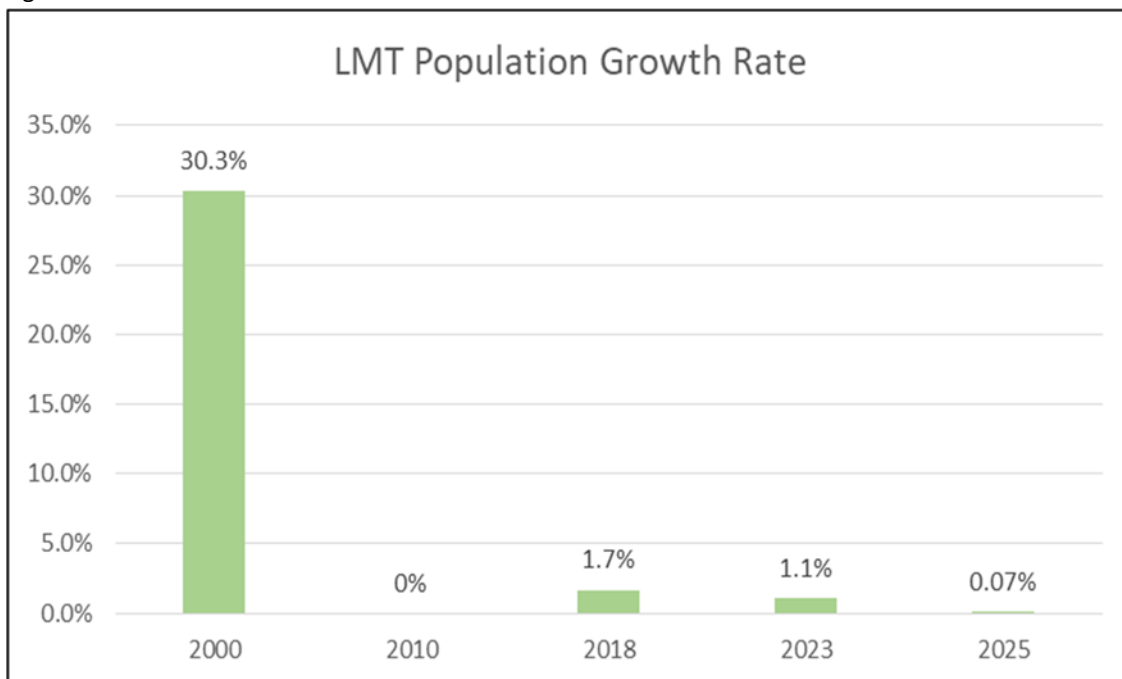


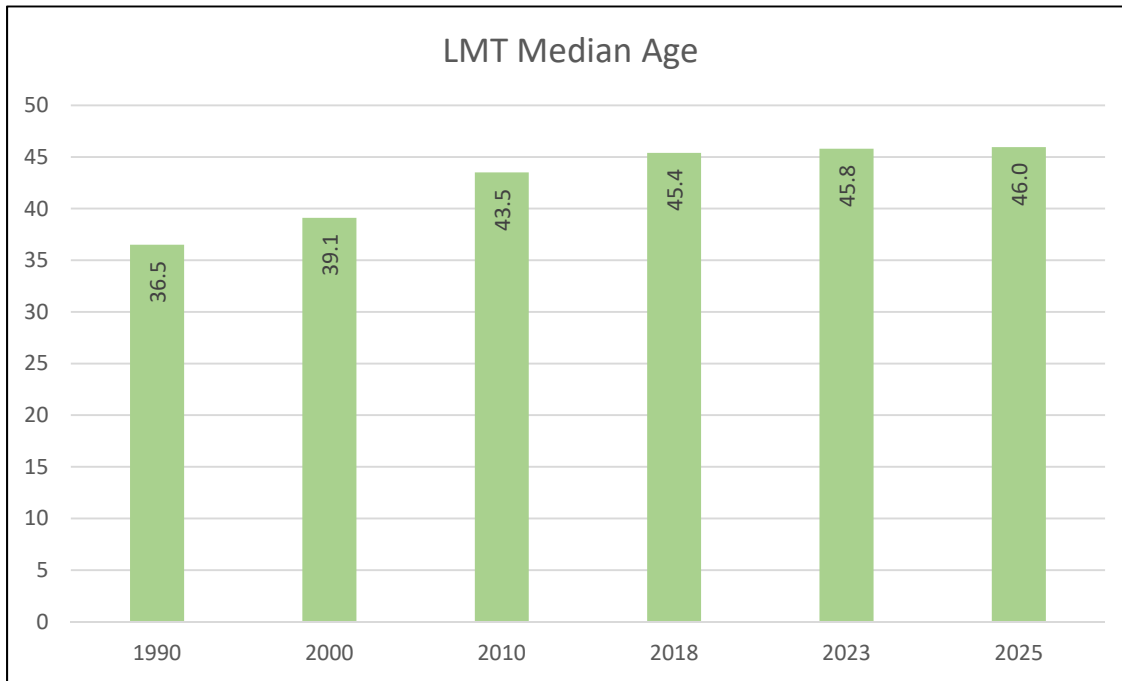
Figure 3



### Median Age

The median age in 2010 is 43.5 years old, rising from the 33.7 median in 1970<sup>1</sup>. The Township’s median age is slightly above the county average, which is 42 years old. According to the *Township of Lower Makefield Comprehensive Master Plan Update 2015 draft*, from 2000-2010, the Township saw a decrease in the number of young adults between the ages of 18 to 34 years<sup>1</sup>. This decrease is consistent with regional trends and is known as the “Brain Drain”- the trend of young professionals moving to other areas that offer more options for employment and housing<sup>1</sup>.

Figure 4



### Population Analysis Ages 18 and Under

Throughout the 35-year study period, the under 18 population cohorts fluctuate more frequently than the total population. Rather than simply look at the total under 18 population, each component age cohort was analyzed to understand and identify trends in current and anticipated growth. The most notable trend across the four cohorts is that there appears to be a generational increase of youth between 1990 and 2010. Throughout the 35 year span, the 0-4 and 5-9 age cohorts experience a peak in growth in 2000. The 10-14 and 15-17 age cohorts experience a peak in growth in 2010, suggesting that the same influx of youth in 2000 caused the older cohorts to reach peak population ten years later. Each cohort levels off and is projected to experience little change in population between 2018 and 2025. Additionally, the 15-17 age cohort is projected to have the lowest population of the four cohorts by 2025.

Figure 5

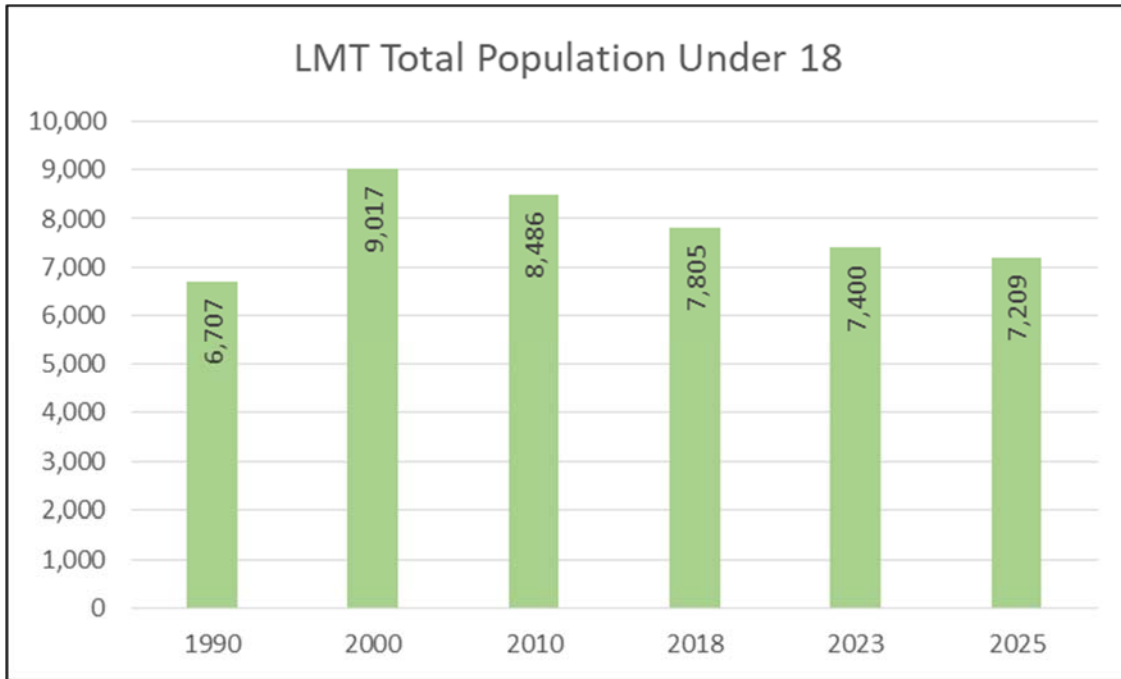


Figure 6

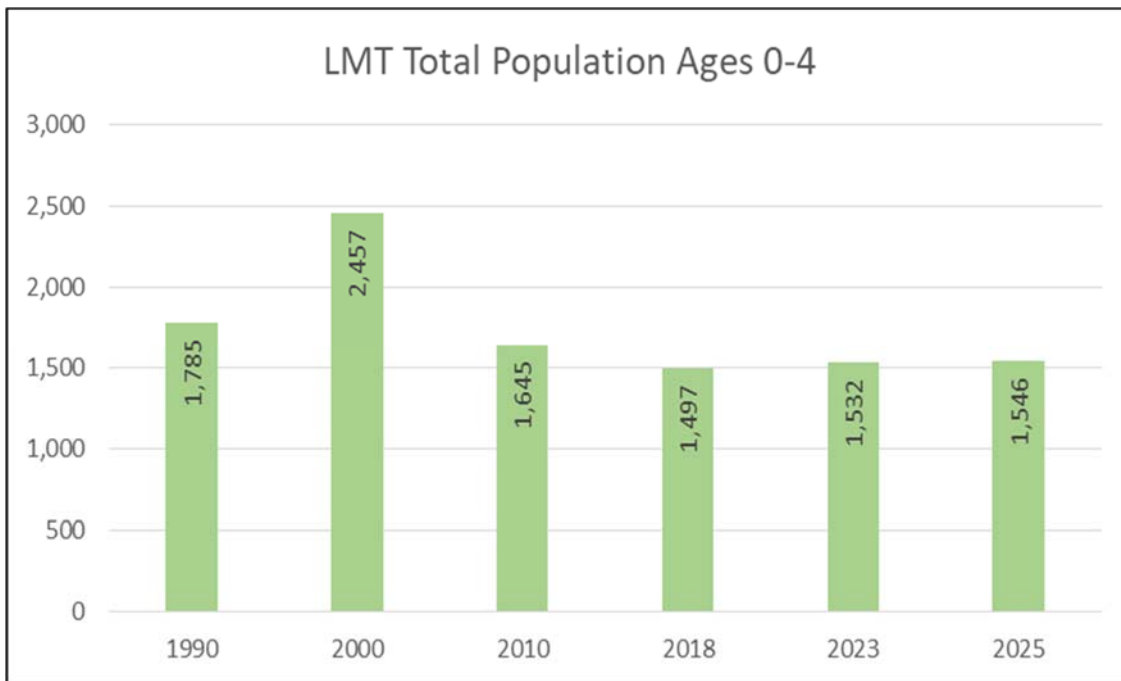


Figure 7

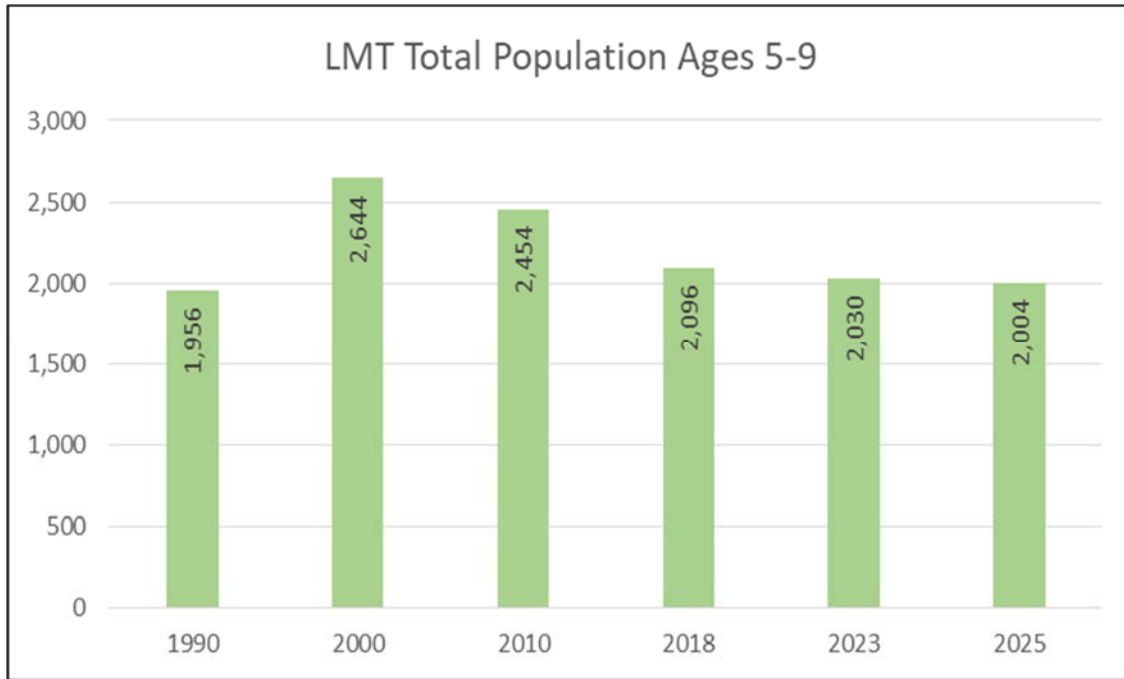


Figure 8

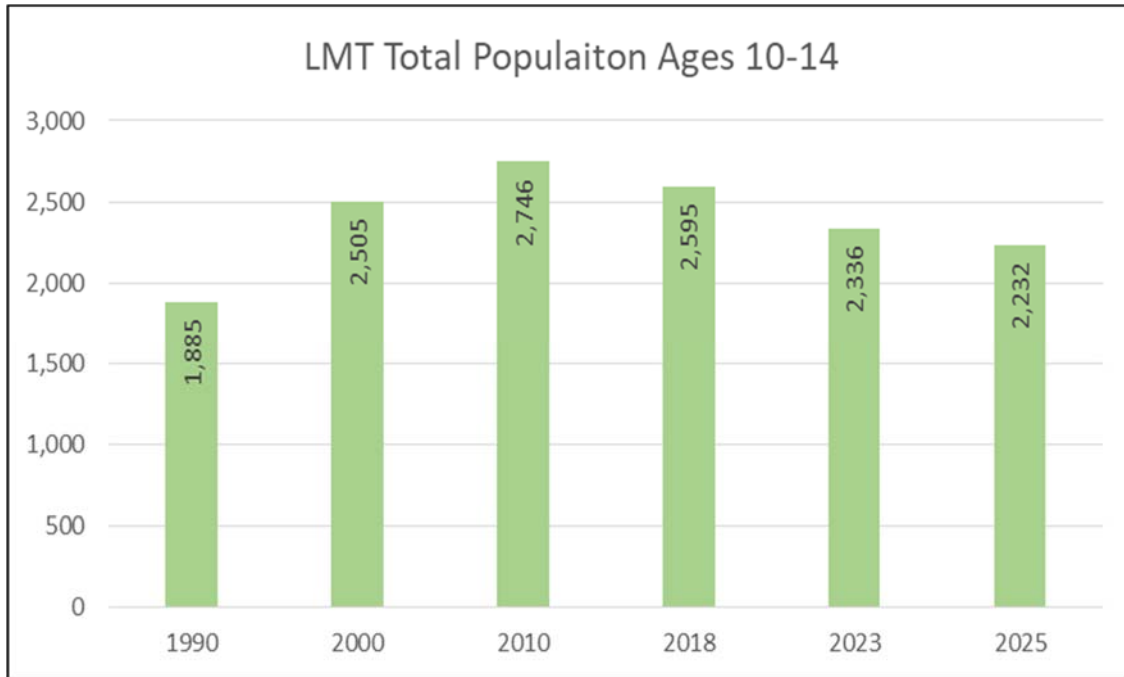


Figure 9

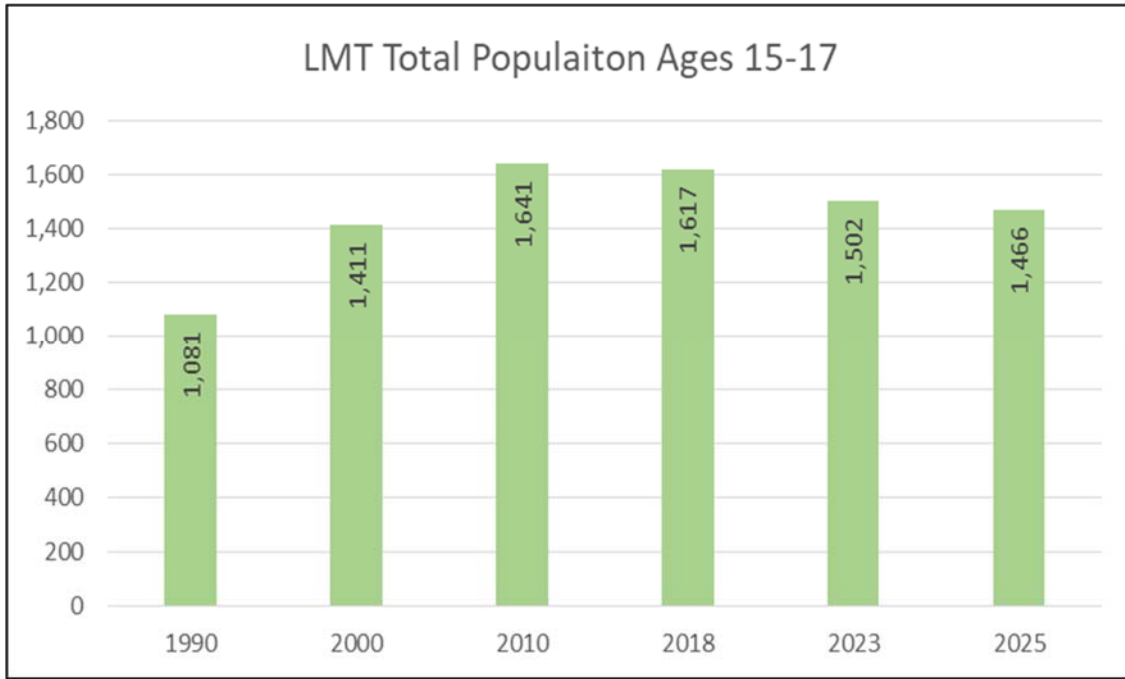
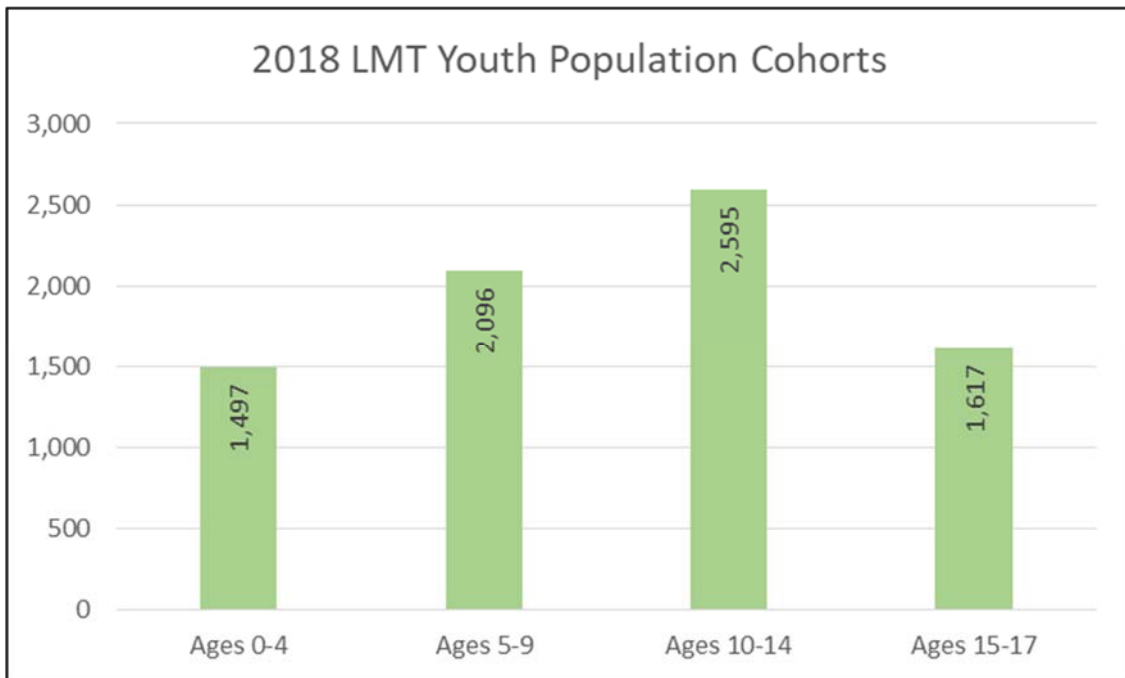


Figure 10



### Children in Households

The total number of households in Lower Makefield substantially increased between 1990 and 2000. The number of households in the Township has not experienced any major subsequent change. Conversely, from 1990 to 2025 the average household size has slightly decreased from 2.83 persons per household to 2.68 persons per household.

Figure 11

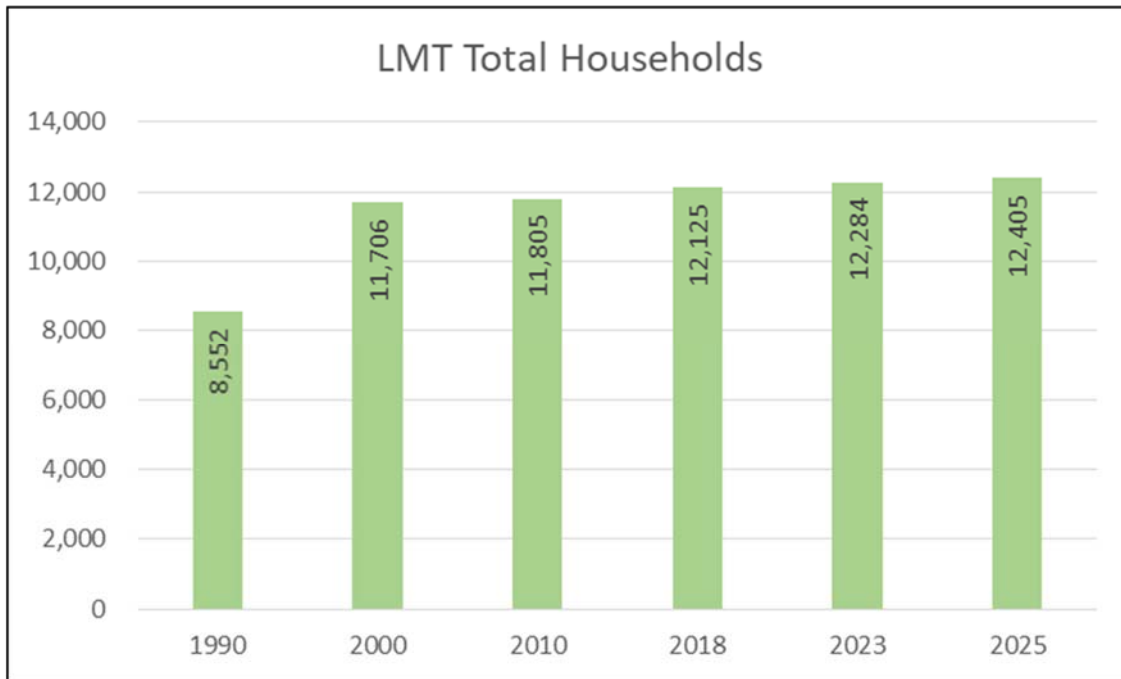
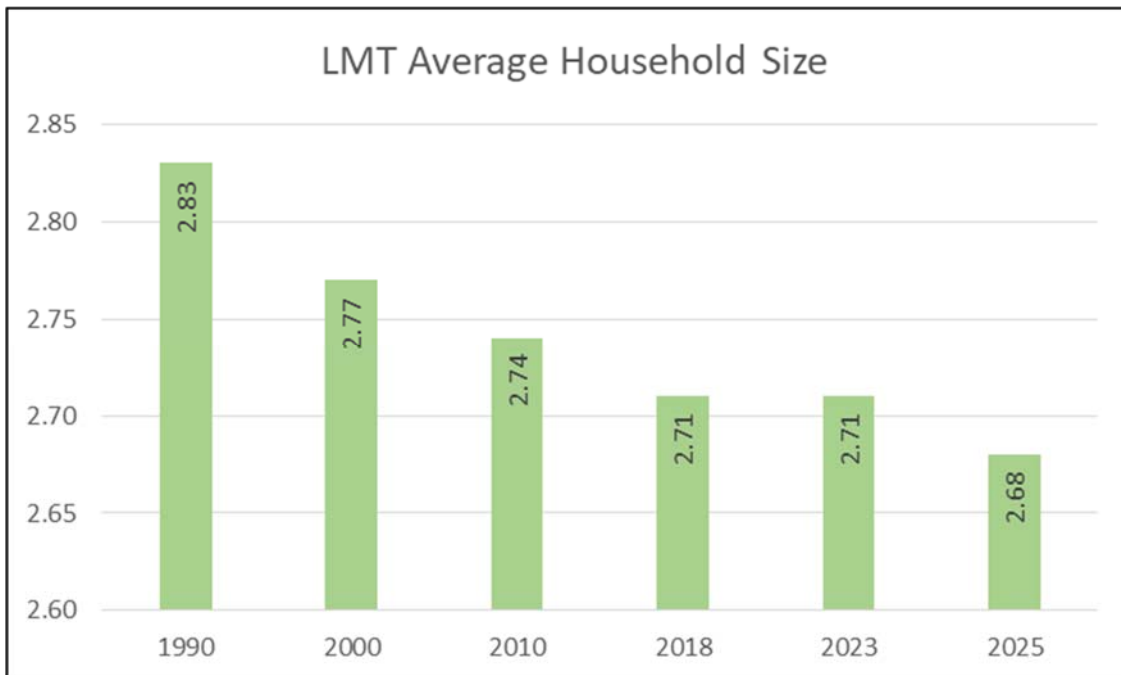
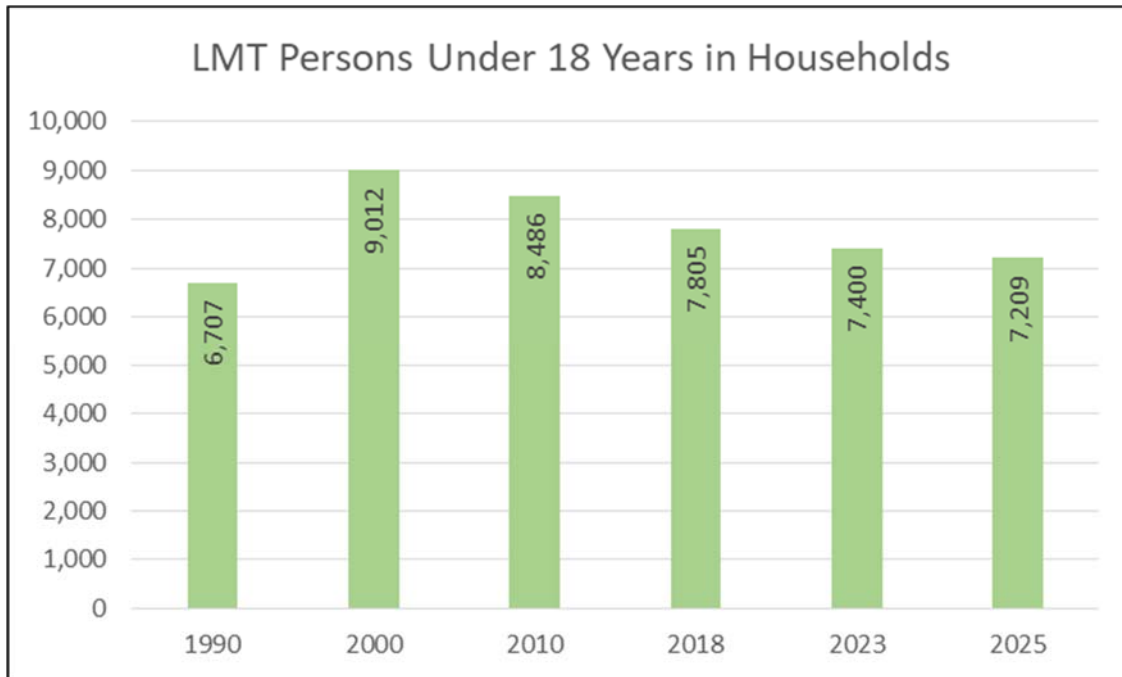


Figure 12



The population of youth in households is nearly identical to the total population of residents under the age of 18. As previously discussed, the population of youths increased in the 1990s and has subsequently slowly declined. Comparable to the average household size, the average number of children in households has experienced a slow decline, dropping from .78 in 1990 to .65 by 2025.

Figure 13





### Housing Units

Similar to the rise and plateau in population growth, the housing market kept pace with the population changes. The total number of units in the Township is currently just over 12,000. Despite the population projections predicting little to no growth by 2025, 86 housing units are anticipated to be built in Lower Makefield between 2023 and 2025.

Figure 14

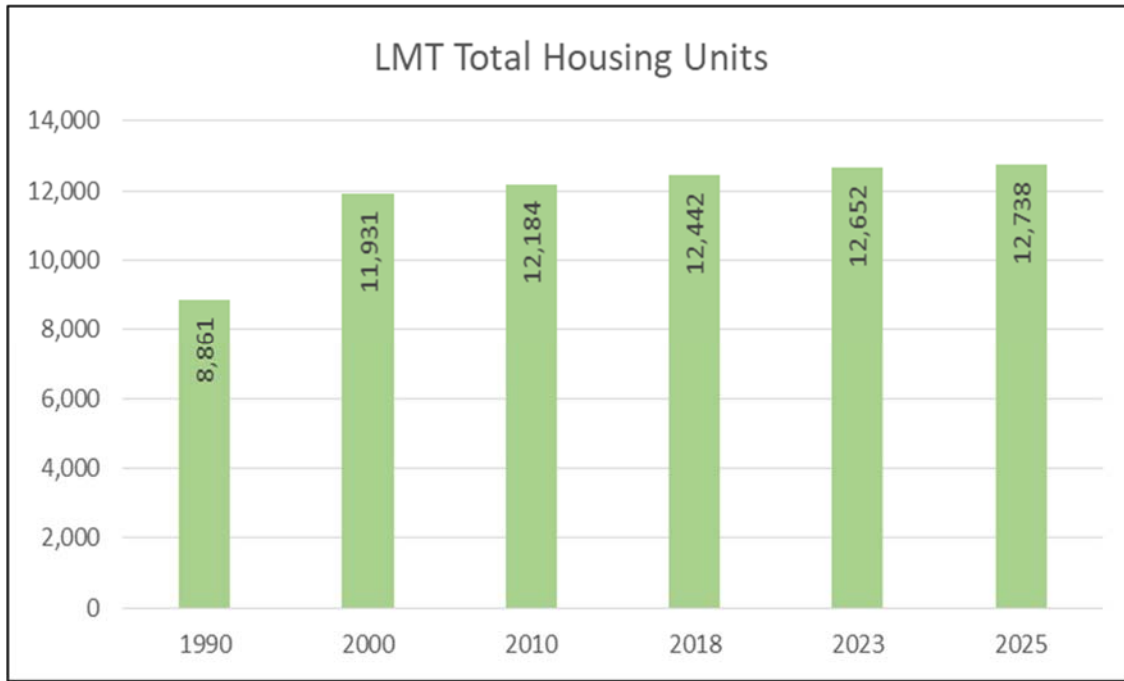
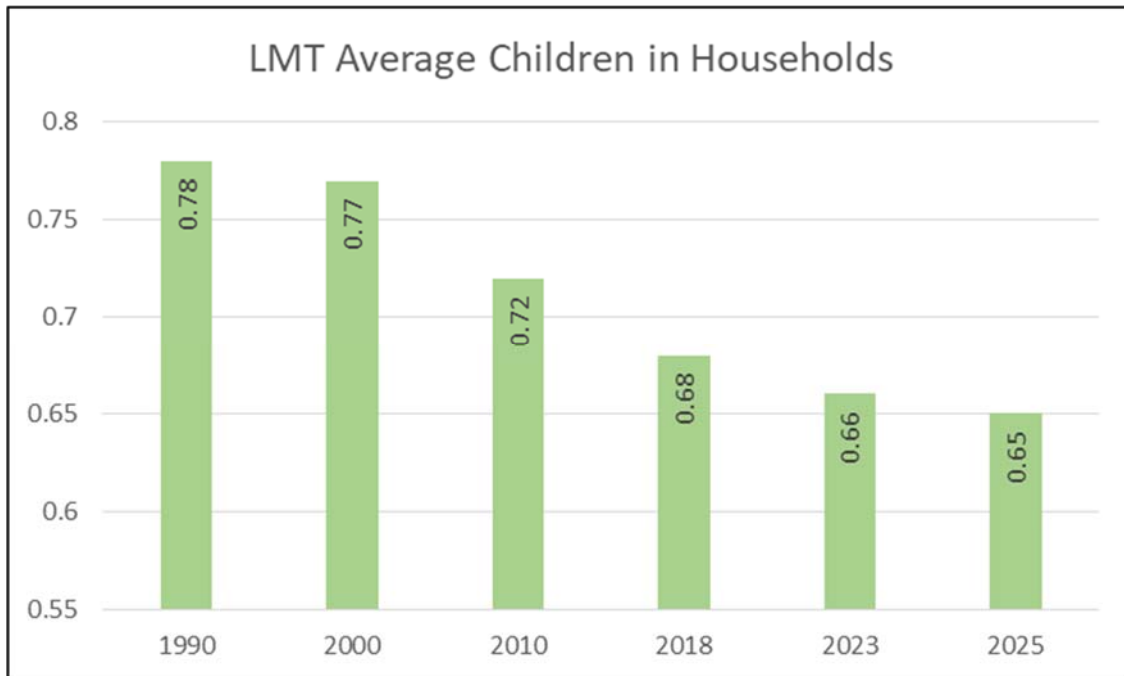


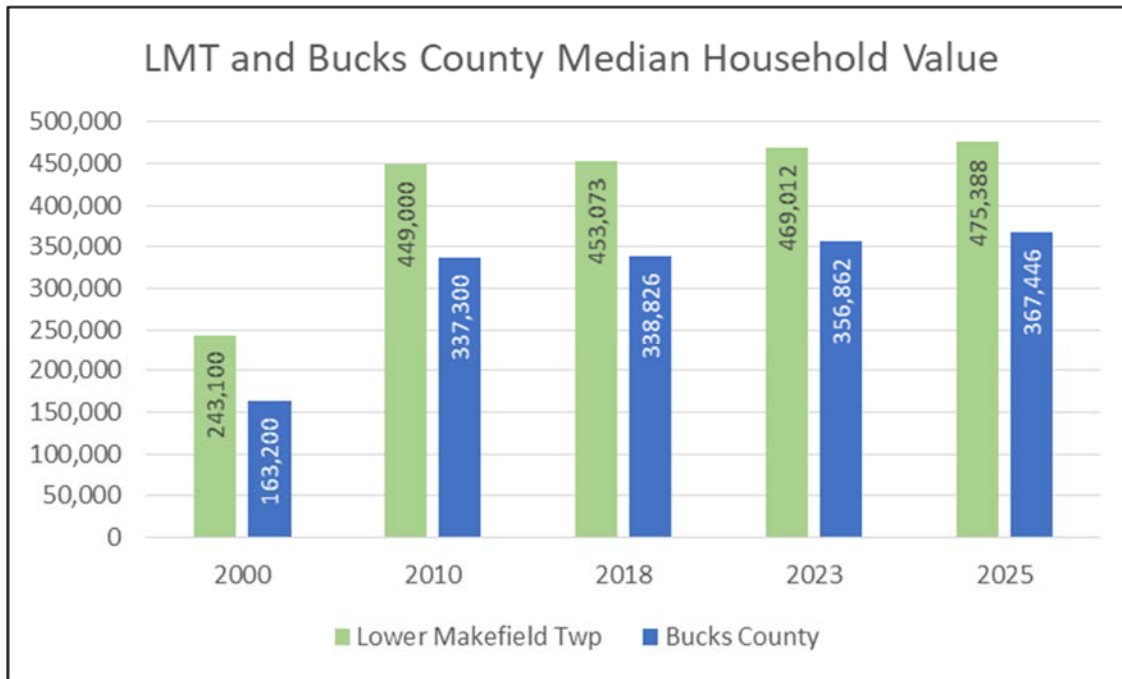
Figure 15



### Housing Value

Unlike the total population and total housing units, the significant spike in median household value did not occur between 1990 and 2000. Median household value of housing units in Lower Makefield increased between 2000 and 2010, after the surge of growth the decade prior. However, median household value stayed high into the 2010s, and is predicted to climb through 2025. The high median household value, in conjunction with an aging population and decrease of residents under the age of 18, suggests that it may be difficult for young adults with young families to find or maintain affordable residency in the Township.

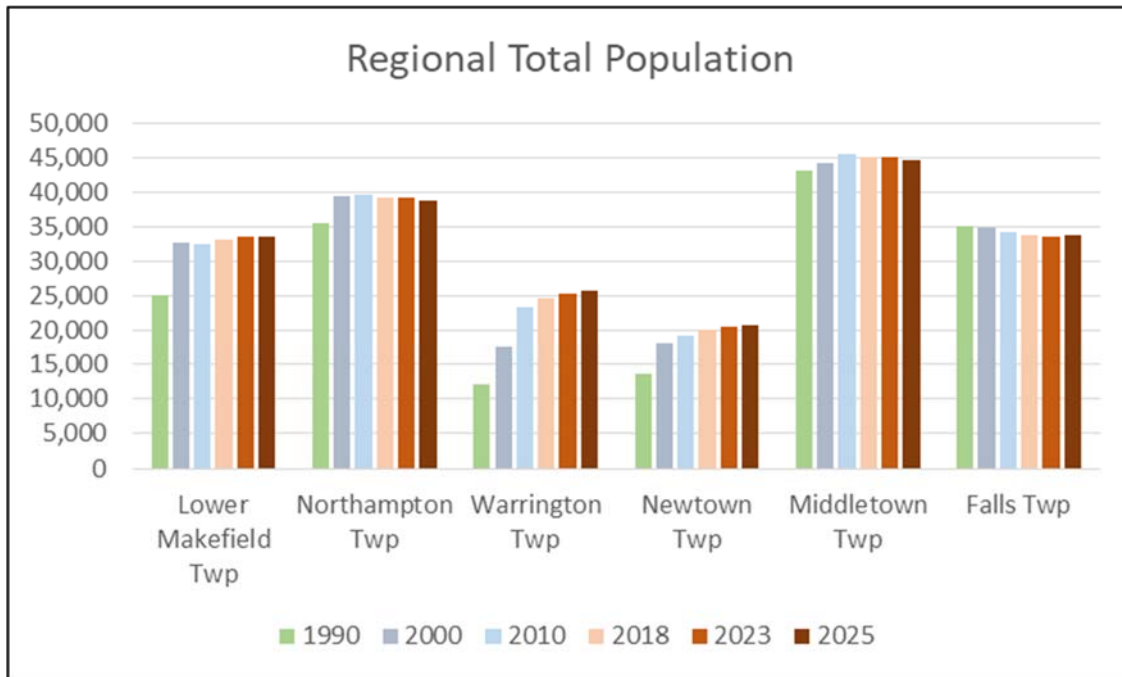
Figure 16



## Regional Demographic Analysis

As part of the analysis, Lower Makefield Township’s demographic makeup was compared to the demographic makeup of other regional municipalities. Additionally, Northampton and Warrington Townships were studied due to their similar classification of “Emerging Suburban Area” in the 2011 *Bucks County Comprehensive Plan*. Figure 17 depicts the regional population of the six townships. Five of the six municipalities experienced population growth between 1990 and 2000. From 2018 to 2025, Warrington Township is expected to see continued growth while each other Township is projected to have little to no population change between 2018 and 2025.

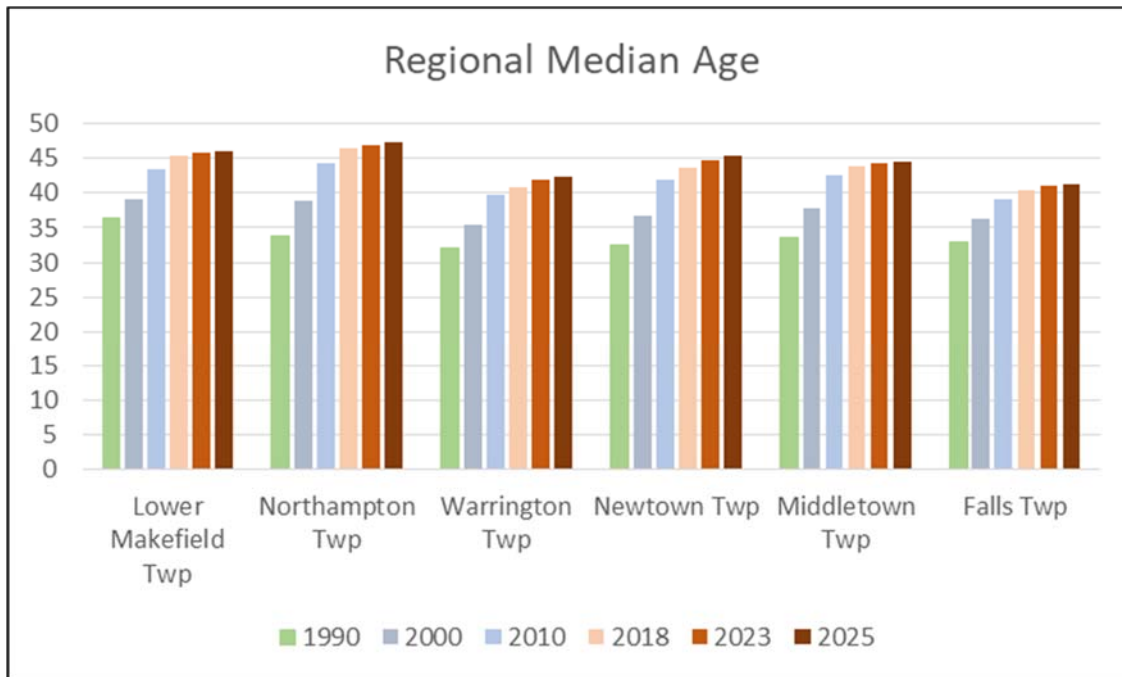
Figure 17



### Median Age

Of the six municipalities, the median age in 2018 is 43.8 years old. Northampton Township and Falls Township have the oldest and youngest populations with a median age of 46.4 and 40.3 years old, respectively. At each year interval each municipality's median age increases. This trend is predicted to continue out to 2025.

Figure 18



### Population Analysis Ages 18 and Under

Lower Makefield Township experienced growth in all youth age cohorts between 1990 and 2000. The same pattern holds true for Northampton, Warrington, and Newtown townships. Middletown and Falls townships followed the same pattern for the 10-14 and 15-17 age cohorts. The 0-4 and 5-9 age cohorts in Middletown and Falls townships experienced no initial increase of population, only a steady decline of youths in these cohorts. Generally, each cohort in each municipality has plateaued and is expected to see little change in population between 2018 and 2025.

Figure 19

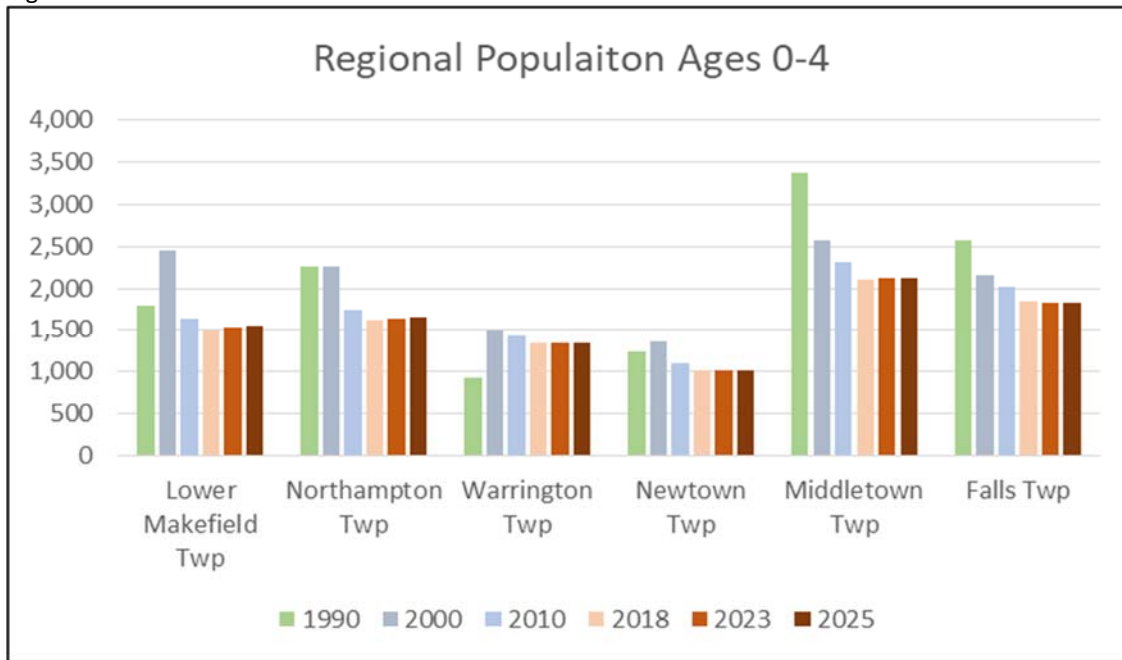


Figure 20

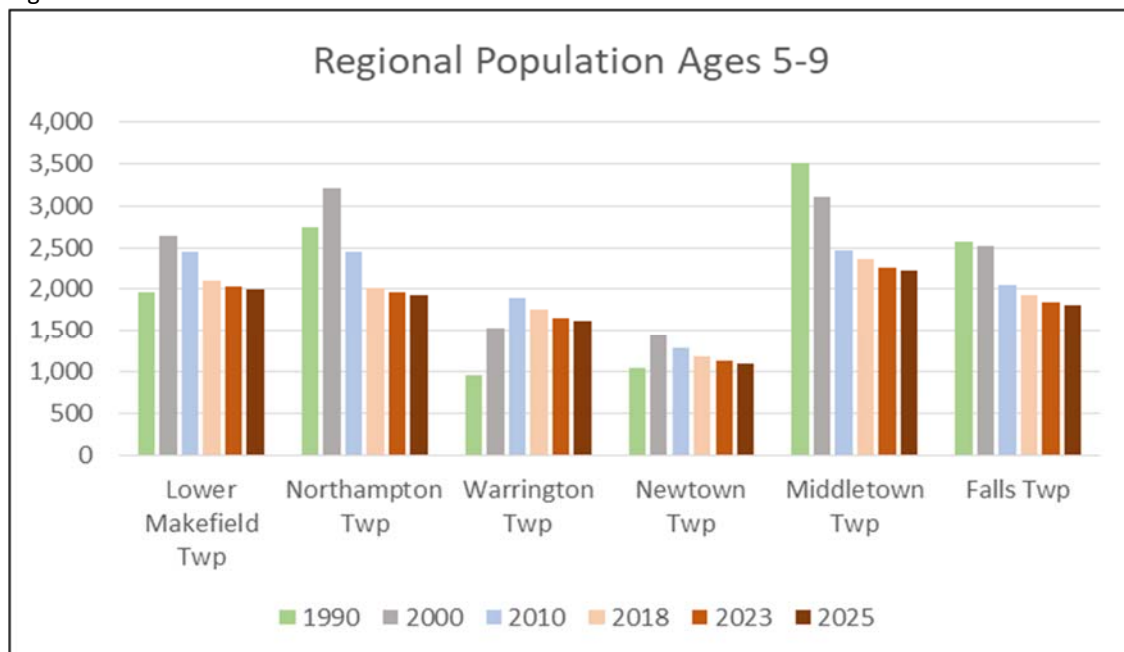


Figure 21

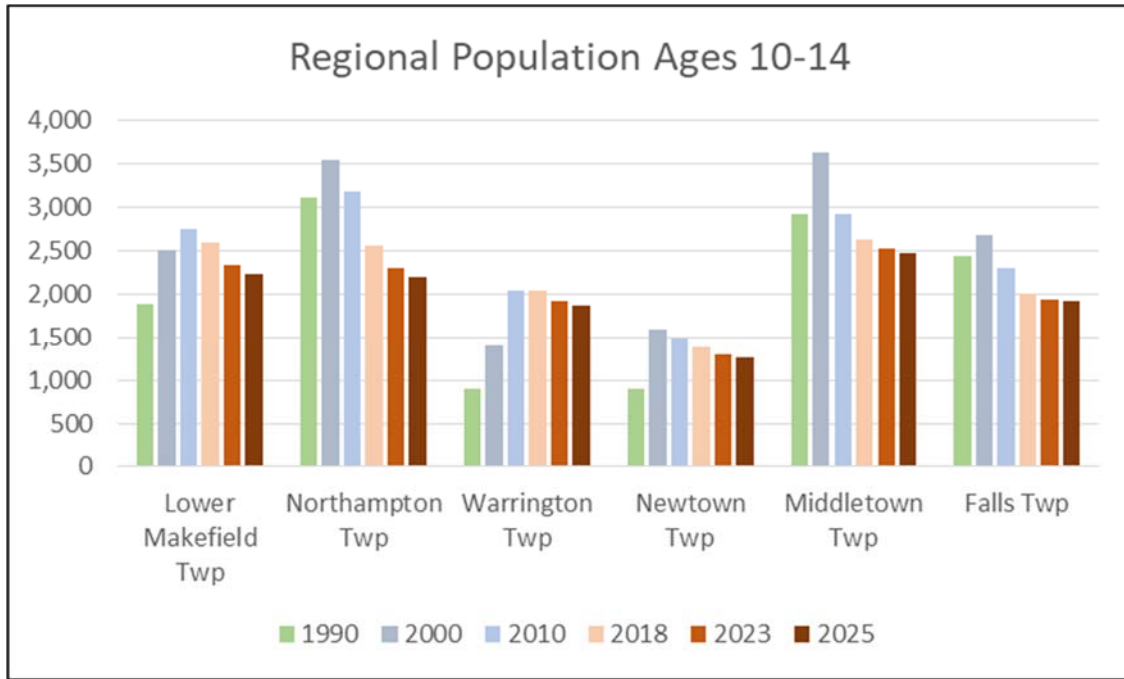
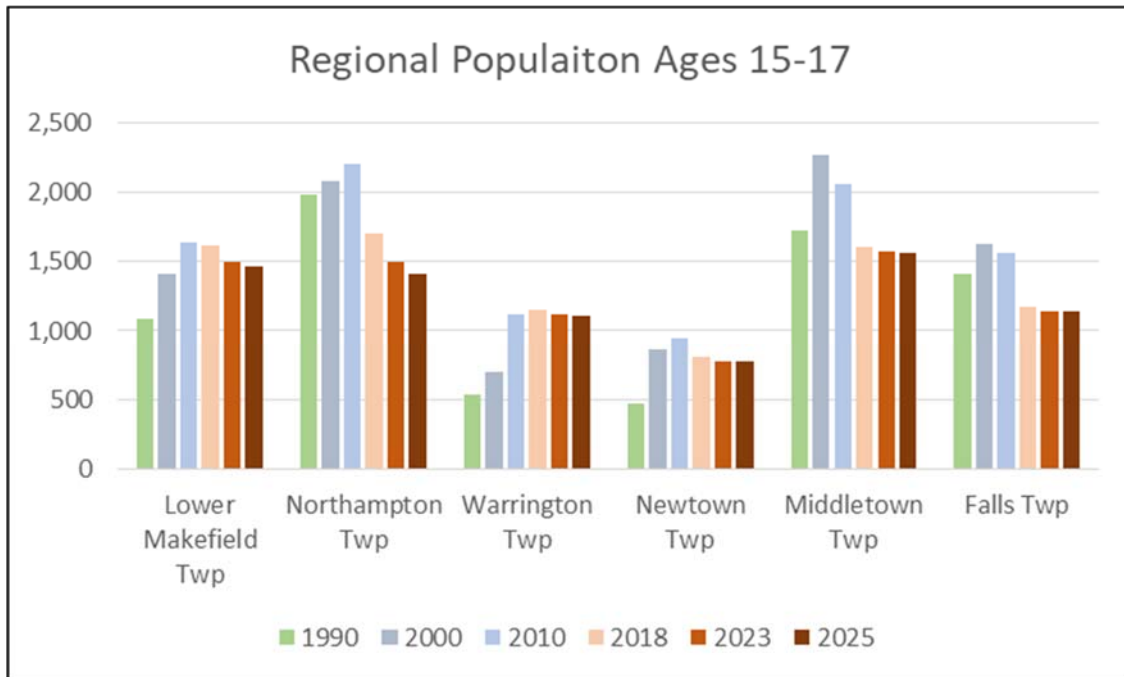


Figure 22



### Housing Units

Of the studied municipalities, Lower Makefield Township is estimated to only have more housing units than Warrington and Newtown townships. Lower Makefield has almost one housing unit for every three Township residents. The regional growth has slowed but the number of total housing units is estimated to continue growing in each studied township through 2025. The same pattern is recurring with median household value. Each municipality experienced a spike in housing value from 1990 to 2000. Regional housing value is projected to continue to rise at a gradual pace.

Figure 23

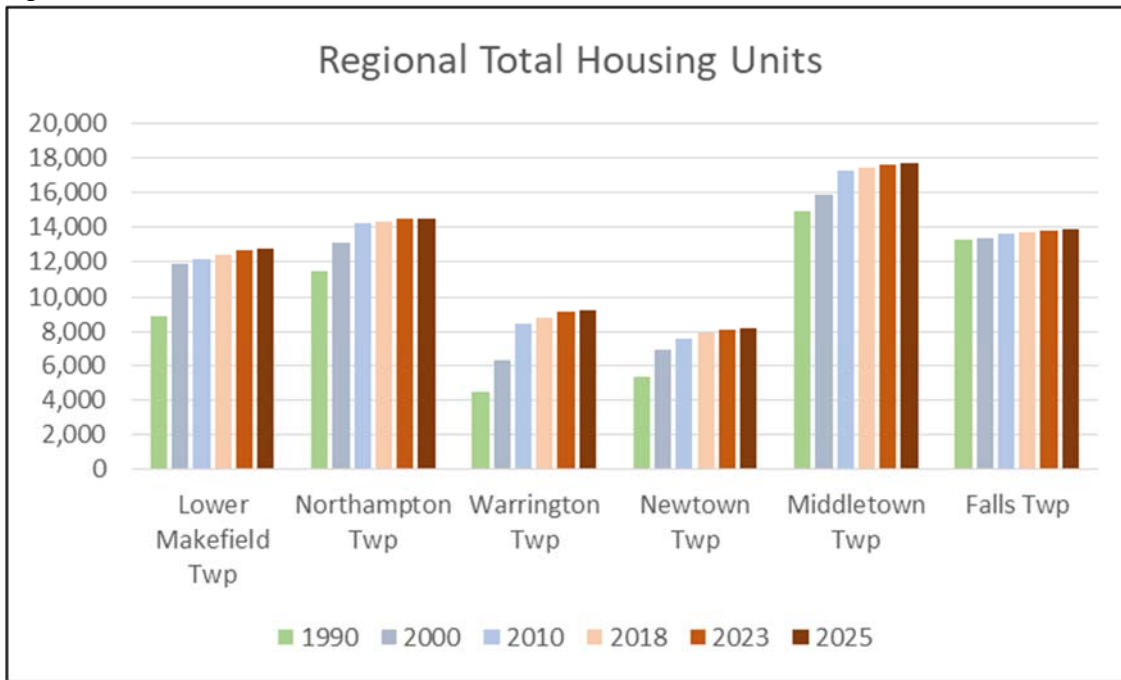
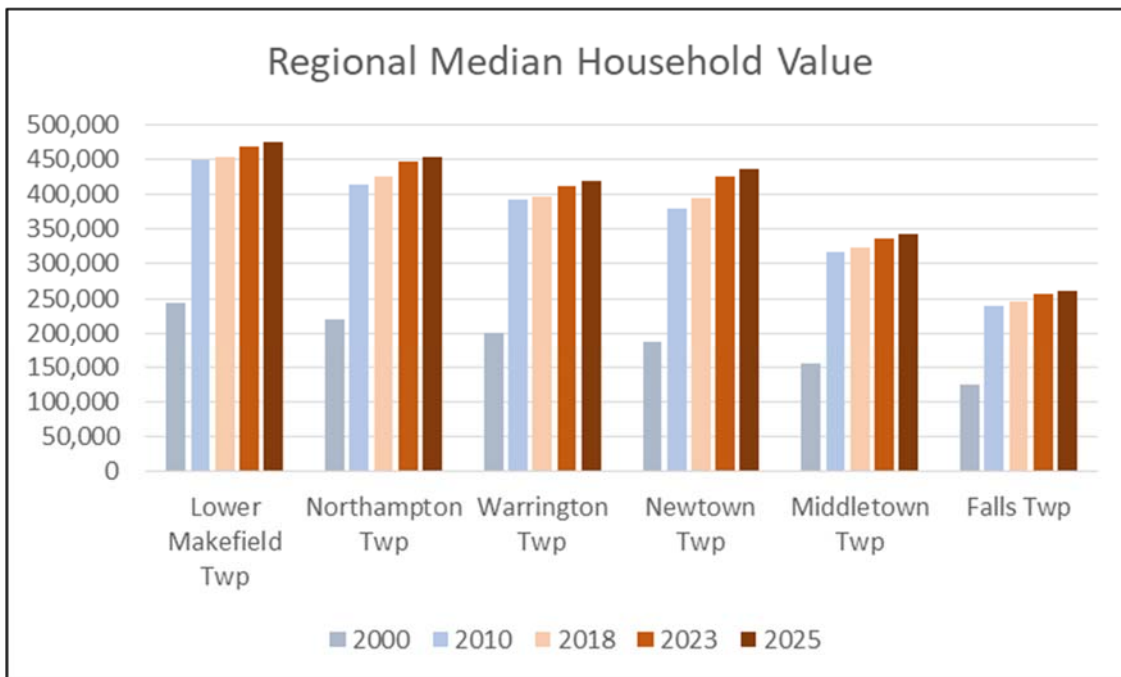


Figure 24



## Recreation Facility Inventory

The BCPC was tasked with evaluating the inventory of the recreational facilities currently in Lower Makefield Township and determining if there is a deficit of available recreational facilities. Lower Makefield Township provided the BCPC with a list of the recreational facilities owned by the Township. The list was verified and the Pennsbury School District schools located in Lower Makefield Township were added to the list. The golf course and Five Mile Woods are Township owned recreation facilities but are excluded for the purpose of this analysis. In figure 25, the Pennsbury School District locations are highlighted in green and the Snipes Tract is highlighted in orange. Of the identified fields and facilities, Macclesfield Park and Memorial Park are the largest facilities by square acre and each have the capacity to host a wide variety of activities. The Community Park is adjacent to Edgewood Elementary School, Fred Allan Softball Complex, and Greg Caiola Baseball Complex. Baseball and softball organizations have been identified as potential user groups of this conglomerate of fields and facilities. Soccer and football leagues have been identified as potential users of fields at Macclesfield Park and other Lower Makefield and Pennsbury School District facilities. Heacock Meadows, Peake Farm, and the Yardley Hunt facilities are pocket parks designed to accommodate small scale facilities for primarily local residential use, like tot lots or tennis courts.

The Pennsbury School District facilities are highlighted in green. Each school has at least one field or facility on its property. In accordance with Michael Dumin, the Director of Facilities, there are no formal agreements with any sports user groups. User groups may occupy school facilities on weekends and evenings as long as the Pennsbury Board of Education's schedule permits. The availability of Pennsbury facilities adds facilities and acres for sports organizations vying for field occupancy. However, the ability for these groups to use these facilities is dependent on the district's own sports usage and schedules. The 36 acre Snipes Tract is highlighted in orange. As previously stated, it is included in this analysis because of the statements in the *Township of Lower Makefield Comprehensive Master Plan Update 2015 draft*. The Snipes Tract, as part of the Township's inventory of facilities, is a potential site for future active and passive recreational facilities and is included in further analysis.

Each facility in the Township provides a space for an active or passive recreational activity. Certain facilities, such as Memorial Park, were designed for informal, passive, non-league sports play. Other facilities, such as Macclesfield Park, were designed to accommodate active recreation from sport organizations. However, Macclesfield Park's total field count has exceeded the number of fields the park was originally designed for. The adjacent parcels have inadequate topographic features to maintain additional fields. The turf quality is noticeably poor on certain fields. In lieu of these issues, certain fields at Macclesfield Park are multi-use and have painted lines on the grass to allow different user groups to play on the fields in quick succession.



Figure 25

Name of Facility	Lot Size (Acres)	Useable Park Area (Acres)
Community Park	25	12
Stoddart Fields	5.7	5.7
Greg Caiola Baseball Complex/Community Center	26	20
Fred Allan Softball Complex	22.75	19
Macclesfield Park	94.7	79
Memorial Park	63.5	57
Veteran's Square Park	2.87	2.87
Heacock Meadows Facilities	4.5	4.5
Makefield Glen/ Dog Park	3.7	2.5
Peake Farm	1.69	1.69
Yardley Hunt/Schuyler Road	1.49	1.49
Yardley Hunt/ Revere Road	1.53	1.53
Snipes Tract	36.2	
Subtotal	289.63	207.28
Quarry Hill/Afton Elementary Schools	37.09	
Edgewood Elementary School	25.28	
Makefield Elementary School	10.12	
Pennsbury Middle School Complex	70.94	
Subtotal	143.43	
Total	433.06	207.28

Macclesfield Park supplies over half of the Township owned facilities, with the majority of the facilities provided at the park being regulation size athletic fields. To avoid counting the same field twice, fields with multiple tenants are counted towards the sport that occupies the field most frequently, based on the user matrix results. It is important to note that the total count of fields at a facility can differ seasonally. For example, Yardley Makefield Soccer (YMS) may have a larger enrollment of youth soccer players one season and will convert a field at Macclesfield Park from one regulation size adult field to two small youth fields. Smaller facilities, such as Makefield Glen/Dog Park, are designed to provide walkable open space and a picnic pavilion for community activities. Makefield Glen/Dog Park is presently a community dog park with additional open space for passive recreation. The total number of recreational facilities doubles when the Pennsbury School District facilities are included in the count. However, there are several logistical obstacles in developing a shared facility plan between the Township and school district.

Each recreation facility in the Township was designed for active or passive recreational use. The facilities constructed for active use typically have several fields or facilities capable of sustaining organized sports. There are eight Township facilities with the current capacity to host organized sports. The four passive facilities boast open space and recreational amenities, such as playgrounds, dog parks, and picnic pavilions. Aerial images were created for each Township and

school district facility and figure 26 includes a list of recreation amenities found at each particular site. Figure 26 excludes the Snipes Tract and Five Mile Woods as neither location contains an active sports recreational amenity.

Figure 26

Name of Facility	Soccer Youth	Soccer Adult	Football	Baseball Youth	Baseball Adult	Softball Youth	Softball Adult	Basketball	Sand Volleyball	Tennis Courts	Playground	Picnic Pavillion	Bocce Ball	Dog Park	Batting Cage
Community Park							x	x		x	x	x			
Stoddart Fields							x		x						x
Greg Caiola Baseball Complex/Community Center				x	x							x			x
Fred Allan Softball Complex							x				x	x	x		x
Macclesfield Park*	x	x		x	x				x		x	x			
Memorial Park								x	x		x	x			
Veteran's Square Park											x				
Heacock Meadows Facilities								x		x	x				
Makefield Glen/Dog Park														x	
Peake Farm											x				
Yardley Hunt/Schuyler Road										x					
Yardley Hunt/ Revere Road										x					
Quarry Hill/Afton Elementary School	x			x			x	x			x				
Edgewood Elementary School	x			x		x	x	x			x				
Makefield Elementary School	x			x				x			x				
Pennsbury Middle School Complex	x		x	x	x	x		x							

\*Facilities at Macclesfield Park include the following: 8 regulation/full size multi-purpose fields, 7 youth soccer fields, 2 regulation size baseball field, 1 youth baseball field, 1 playground, four sand volleyball courts, and two picnic pavilions.

The following exhibit is a map of the recreational facilities within Lower Makefield Township. It is evident that there could be a proximity, walkability, and ease of access issue for residents in some areas of the Township due to the skewed distribution of the recreational facilities. The southern half of the Township houses the majority of the recreational facilities. Residents in the northern region need to commute a relatively sizeable distance to get to a recreational facility with athletic fields. The three facilities in the northern half of the Township, labelled as numbers 6, 13, and 14, are identified as Memorial Park, the Snipes Tract, and Quarry Hill/Afton Elementary Schools, respectively. The Snipes Tract is undeveloped and Memorial Park is designed exclusively for non-league, self-directed, passive recreation. Therefore the only recreational facility for active use in the northern part of the Township is Quarry Hill/Afton Elementary Schools.

## Recreational Activities and Inventory Analysis

Lower Makefield Township maintains 8 recreational facilities that are currently available for active and organized sport recreational use. In order to determine if the current supply of facilities is adequate to serve the Township’s population, analysis on recreational activity participation rates was conducted. This analysis included studying the regional participation rates in sports, contacting potential user groups with a user matrix, and comparing Lower Makefield Township’s supply of facilities to the recommendations of the NRPA. The number of Township and school district owned fields and facilities that are slated for active use are detailed on figure 27. The tally of facilities in figure 27 reflects what currently exists at the time of the analysis.

Figure 27

Name of Facility	Soccer Youth	Soccer Adult	Football	Baseball Youth	Baseball Adult	Softball Youth	Softball Adult	Basketball	Tennis Courts
Community Park							1	1	4
Stoddart Fields							3		
Greg Caiola Baseball Complex/Community Center				1	1				
Fred Allan Softball Complex							3		
Macclesfield Park	7	8		2	1				
Heacock Meadows Facilities								1	2
Yardley Hunt/Schuyler Road									4
Yardley Hunt/ Revere Road									3
Quarry Hill/Afton Elementary School	2			4			1	1	
Edgewood Elementary School*	10			3		1	1	2	
Makefield Elementary School	1			1				4	
Pennsbury Middle School Complex	5		1	1	2	3		2	

*\*The 10 youth soccer fields at Edgewood Elementary School are smaller than youth soccer fields at other facilities.*

## **NRPA Standards**

The National Recreation and Park Association (NRPA) is the leading non-profit organization dedicated to the advancement of public parks, recreation and conservation.<sup>12</sup> Funded through grants, registrations, dues, and charitable contributions, the NRPA produces research, education, policy and standards for recreational community enrichment.<sup>12</sup>

In the past, the NRPA published a national standard to function as a guideline to determine land requirements for various kinds of park and recreation areas and facilities. The standard was based on acreage, facility size, location, and units of population within a service radius. This standard, developed by professional and trade associations and based on metropolitan studies on land development for open space, was accepted by the majority of communities across the country.<sup>12</sup> Communities used the standard as a guideline to ensure the minimum capacity of acceptable fields and facilities were present. The standard proved to be a means to justify the need for parks and open space within overall land use patterns. Specifically, it provides a guideline for how many acres of parkland a community should provide given the unit of population they are serving. The standard provides recommendations for a given activity including square feet, dimensions, orientation, number of units (acres) per population, and service radius.

In recent years, the NRPA has moved away from publishing a national standard. The philosophy of parks and recreational development has evolved from a national checklist into a series of guidelines catered to individual agencies at the local level. The NRPA cites the reason for the shift simply because no two parks are the same and different agencies serve different residents with unique needs, desires, and challenges<sup>12</sup>. The national standard approach waned in popularity because different communities that consulted the national standard may be similar in park acreage but differ in funding or demographic makeup. Based on the standard, some communities may show a deficiency in recreational facilities but have a rapidly aging population who do not participate in athletic and recreational activities. In lieu of the standard, the NRPA recommends agencies survey their communities to identify the demographic build of the service area.<sup>12</sup> The BCPC has recommended to Lower Makefield Township that a statistically valid residential survey be conducted.

The NRPA develops an Agency Performance Review report (APR), which is a conglomerate of survey results from agencies who surveyed their communities. The 2018 NRPA APR report is a reflection of what exists, not a guideline or standard. The report is accessible for agencies to consult as a way to view the park and recreational development in other communities similar to their own.

The NRPA provides agencies with two additional community development tools. The first is a Facility Market Report which can be customized by key census and marketing data to generate a recommendation for the specific needs of an agency and community. Another NRPA resource is the American's Engagement with Parks Survey. This annual survey gathers opinions on park challenges, importance, and local government interaction and funding from community

residents. The most recent survey states that nine in ten Americans believe parks and recreation is an important local government service.<sup>12</sup>

The 2018 NRPA APR report synthesizes the results of surveys from 1,069 parks and recreation agencies across the United States from 2015 to 2017. The synthesized data is accessible to agencies via the NRPA Park Metrics tool. The Park Metrics tool can be used to compare a given agency to other agencies of similar stature. General statistics pulled from the 2018 APR report are available through Park Metrics as well. For example, of those surveyed, the average residents per park is 2,114 and the average acres of parkland per 1,000 residents is 10.1 acres.<sup>12</sup>

The data tables, found in the 2018 APR, can act as a reference point for Lower Makefield Township. The tables are divided into categories based on jurisdictional population. Lower Makefield Township's 2018 population is estimated to be 33,108, which places Lower Makefield Township in the 20,000 to 49,999 jurisdiction category<sup>13</sup>. The 20,000 to 49,999 resident cohort distinction is highlighted in figures 28 and 29.

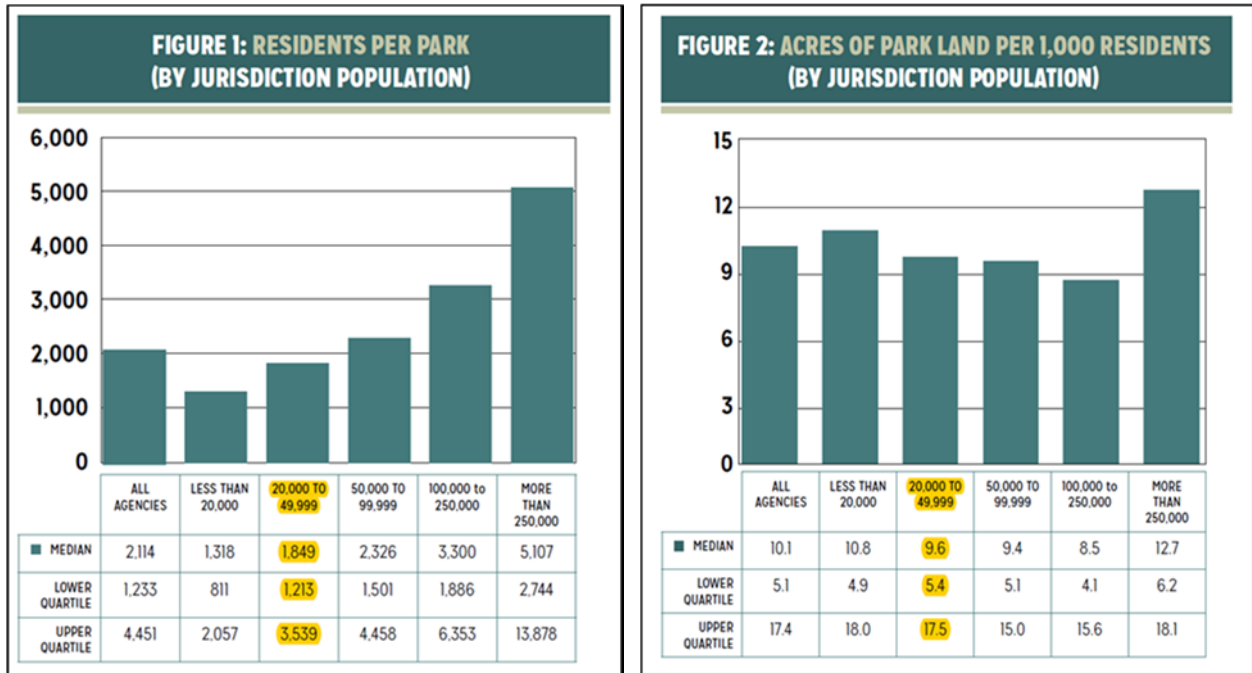
Agencies servicing between 20,000 and 49,999 residents report on average, one park or recreational facility per 1,819 residents.<sup>12</sup> The Township has a population estimated to be 33,108 and operates 14 parks and recreational facilities meaning they provide 1 park or recreational facility per 2,365 residents. Ideally, there would be fewer residents served by a park to ensure greater accessibility and use for the serviced population. Therefore, a smaller number of residents is suggested for a single facility to serve. *The current ratio of 1 facility over 2,365 residents is below the national average of 1 facility per 1,819 residents, suggesting that the Township is deficient in number of facilities.*

Additionally, Lower Makefield Township and other agencies servicing between 20,000 and 49,999 residents are recommended on average to provide 9.6 acres of parkland per 1,000 residents.<sup>12</sup> The Township has a population estimated to be 33,108 and maintains 587.63 acres of parkland. The Township's population is 33.108 times more than the NRPA's average. To determine if enough acres of parkland are provided, the NRPA average of 9.6 acres was multiplied by 33.108. Based on the Township's population size, the average acreage of parkland that should be maintained is 317.84 acres. *The Township is currently supplying 17.71 acres of parkland per 1,000 residents. This suggests that the Township's supply of acres of parkland exceeds the national average.*

Lower Makefield Township is estimated to have 33,108 residents, 14 parks and recreational facilities and 587.63 acres of parkland. Based on the results in the APR, a township with a population of 33,108 typically provides 18.2 parks and 317.84 acres of parkland. Therefore, based on this metric, Lower Makefield Township could be considered to be deficient in its number of park and recreational facilities but sufficient and exceeding the national average of number of acres of parkland. It should be documented that these calculations include the Snipes Tract and Five Mile Woods. The Snipes Tract is included in this inventory tally because it is a Township asset that has potential to become a recreational facility. The Five Mile Woods is a large Township asset

consisting of nature trails and open space. The facility is counted in this portion of the study but as it has no sports and recreational facility relevancy, is not included in the following analysis.

Figures 28 and 29 (NRPA)



The 2018 NRPA APR report guided this portion of this study. The initial research gathered the necessary demographic data and comparing Lower Makefield Township’s park and recreation status to the national standards produced by the NRPA. As the NRPA shifted the philosophy of the parks and recreation guidelines from a national standard to a conglomerate of survey results, the focus of this study followed suit, analyzing both the old NRPA standard method and the 2018 NRPA APR recommendations. For the purpose of this report the NRPA APR regulation field size definitions were used, but the BCPC recognizes that multiple field configurations and sizes exists, specifically the US Youth Soccer and FIFA standards.

### NRPA Standard Equivalent

The National Recreation and Park Association is the leading non-profit organization dedicated to the advancement of public parks, recreation and conservation<sup>12</sup>. In previous years, the NRPA developed a standard for park and recreation agencies to follow when determining how to operate their recreational facilities. Recently, the NRPA has moved away from publishing a national standard and instead publishes an Agency Performance Review report. The report is a conglomerate of survey results from park and recreation agencies who surveyed their communities, attempting to discover community values and needs in regards to park and recreation facilities. The report is not a standard or a guideline but a reflection of what exists and the NRPA advises park and recreation agencies to use the document as a reference point.

The 2018 NRPA Agency Performance Review report synthesizes the results of surveys from 1,069 parks and recreation agencies across the United States from 2015 to 2017. Figure 30 provides an example of the NRPA standard method, comparing the old NRPA standard from 1990 to the 2018 APR report recommendations in figure 31. Certain sports were not divided by field size or youth and adult participants in the 1990 standard method report. For example, based on the 1990 report data Lower Makefield Township should provide 7.6 baseball fields due to the size of their population. The report does not differentiate between the inventory of youth and adult regulation size fields, so long as the final tally is greater than or equal to 7.6 fields. However, in the case of baseball fields, the report does detail that at least one of the 7.6 fields should be lit, provided that the serviced population is over 30,000. A standard was not generated for other sport facilities at all, such as lacrosse fields. The data in figure 30 reflects how many facilities Lower Makefield should provide based on their population. Of note, the number of tennis courts recommended is drastically different between the two methods.

Figure 30

Facility Type	Units per Population	1990 Standard
Basketball	1 per 5,000	6.6
Tennis	1 per 2,000	16.6
Baseball	1 per 5,000	7.6
Softball	1 per 5,000	6.6
Soccer	1 per 10,000	3.3
Football	1 per 20,000	1.7
Field Hockey	1 per 20,000	1.7

Figure 31

Facility Type	2018 APR Recommendations
Basketball Courts	5.5
Tennis Courts	7.8
Diamond Fields- Baseball Youth	5
Diamond Fields- Baseball Adult	1.8
Diamond Fields- Softball Youth	3.6
Diamond Fields- Softball Adult	2.7
Rectangular Fields- Soccer Youth	5.6
Rectangular Fields- Soccer Adult	2.8
Rectangular Fields- Football	1.5
Rectangular Fields- Field Hockey	2.1
Rectangular Fields- Lacrosse	1.5

The analysis of the report was conducted to determine if Lower Makefield Township is deficient, meets, or exceeds average recreational needs. Lower Makefield Township has 14 parks and 587.63 acres of parkland including Snipes tract and Five Mile Woods. As previously represented in figures 28 and 29, the survey results in the APR suggest that a township with a population of 33,108 should provide 18.2 parks and 317.84 acres of parkland based on a national average. *Therefore, the NRPA APR suggests that Lower Makefield Township has a deficient number of parks but exceeds the average acres of parkland.*

The recreational facilities in Lower Makefield were analyzed alongside the NRPA APR survey results in the same fashion. Figure 32 details the results of the survey that highlight the outdoor recreational facilities. Lower Makefield Township has a population density of 1,849.6 residents per square mile. In relation to figure 32, the Township is included in the 1,501 to 2,500 residents per square mile cohort. Using playgrounds as an example, the figure details that 92% of the 1,069 agencies surveyed have one playground facility. The median number of residents per the one playground facility is 3,600. A park and recreation agency servicing 1,501 to 2,500 residents per square mile has one playground for every 3,000 residents. In 2018, Lower Makefield Township’s population is estimated to be 33,108. Therefore, the report suggests that the Township should provide 11 playgrounds for its residents. Lower Makefield Township currently maintains seven playgrounds, thus is deficient in its inventory of playground facilities. Extrapolating this further, the APR survey suggests that for Lower Makefield Township’s population the Township should have 5.6 recreational fields for youth soccer and 2.1 recreational fields for field hockey, if they were to provide the given facilities. Presently, Lower Makefield Township has 7 youth soccer fields and 0 field hockey fields. The Township exceeds the national average of youth soccer fields and is deficient in field hockey fields.



Figure 32 (NRPA)

<b>FIGURE 3: OUTDOOR PARK AND RECREATION FACILITIES—POPULATION PER FACILITY (BY PREVALENCE AND POPULATION PER FACILITY)</b>						
	Median Number of Residents per Facility					
	% of Agencies	All Agencies	Residents per Square Mile			
			Less than 500	500 to 1,500	1,501 to 2,500	More than 2,500
Playgrounds	92%	3,600	6,132	3,558	3,000	3,572
Basketball courts	83	7,122	7,869	7,040	6,037	7,350
Tennis courts (outdoor only)	77	4,545	5,462	4,833	4,250	4,578
Diamond fields: baseball - youth	75	6,519	6,628	5,358	6,613	7,770
Diamond fields: softball fields - adult	66	12,000	10,957	9,491	12,083	14,725
Rectangular fields: multi-purpose	63	8,055	9,043	6,158	7,691	9,547
Diamond fields: softball fields - youth	59	9,900	10,495	8,181	9,255	12,121
Diamond fields: baseball - adult	55	18,880	15,000	13,367	18,140	25,179
Dog park	55	41,500	51,804	37,000	40,000	49,665
Swimming pools (outdoor only)	52	31,709	42,344	23,350	31,600	40,218
Totlots	47	12,104	19,766	10,625	14,850	11,301
Rectangular fields: soccer field - youth	47	6,039	5,584	5,082	5,900	8,773
Community gardens	46	27,587	37,571	30,346	28,605	27,042
Rectangular fields: soccer field - adult	42	11,383	10,250	9,833	11,692	15,746
Multiuse courts - basketball, volleyball	38	14,650	12,757	12,105	15,214	18,557
Diamond fields: tee-ball	38	14,511	11,270	12,763	13,045	18,557
Rectangular fields: football field	38	24,742	21,750	19,023	22,615	35,453
Ice rink (outdoor only)	16	17,310	11,168	13,669	17,072	25,500
Multipurpose synthetic field	15	41,719	35,238	20,888	28,728	54,161
Skate park	14	46,850	27,375	40,620	37,607	61,306
Rectangular fields: lacrosse field	11	24,060	12,522	17,500	22,119	29,924
Rectangular fields: cricket field	9	160,000	199,889	288,617	160,000	108,575
Overlay field	6	12,844	10,820	7,200	55,245	15,831
Rectangular fields: field hockey field	4	20,893	20,893	23,034	15,757	22,500

## Comparison Analysis

The relevant outdoor recreation facilities were compared with the results of the APR report. Figures 33 and 34 represent the survey results of the NRPA study and the Lower Makefield Township recreation facilities inventory. The NRPA 2018 APR differentiates between youth and adult diamond and rectangular fields. Not all fields and facilities in Lower Makefield Township are a permanent size and differ depending on the needs of the user group and seasonal activity. The inventory count is a reflection of field sizes at the time of the analysis. Additionally, the NRPA provided separate definitions for youth and adult fields. Youth baseball fields are defined as having anything less than a 90-foot base path. Youth softball fields are defined as having anything less than a 60 foot base path and 200 foot outfield fence. Adult soccer fields must be at least 210 feet by 360 feet, so any field that does not meet these dimensions is defined as a youth field. The Township's facility inventory followed these definitions to the greatest extent possible.

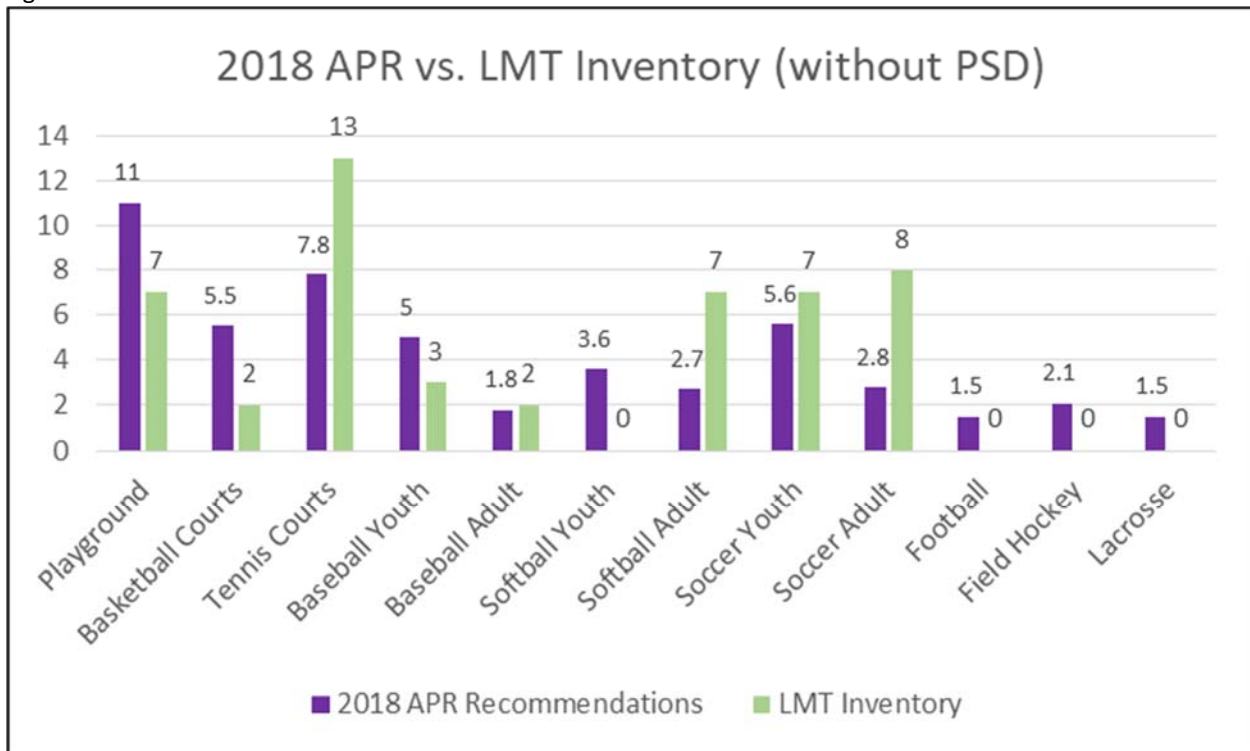
The Lower Makefield Township inventory listed in figures 33 and 34 does not include the Pennsbury School District facilities. The Lower Makefield Township owned and operated facilities were initially analyzed and the facilities maintained by the school district were analyzed separately.

The Township's inventory is frequently distant from the NRPA study recommendations, either greatly exceeding or substantially deficient. The Township is deficient in playgrounds, field hockey fields, youth softball fields, and basketball courts. Some inventoried fields can be used by multiple sport organizations and can accommodate activities such as youth softball, but the inventory total does not include any youth softball fields. The Township exceeds the survey result recommendations in tennis courts and youth and adult soccer fields. The wealth of tennis courts is expected as it was determined that Lower Makefield Township has a regionally higher rate of tennis participants. It should be noted that the LMT Pickleball Club occupies the Township's tennis courts as well which further explains the above average quantity of courts. The amount of adult soccer fields in Lower Makefield is over the NRPA recommendation to a considerable extent. However, the inventory of adult soccer fields in the Township may include fields that could be counted in other NRPA categories, such as rectangular multi-purpose fields and multi-purpose turf fields.

Figure 33

Facility Type	2018 APR Recommendations	LMT Inventory
Playground	11	7
Basketball Courts	5.5	2
Tennis Courts	7.8	13
Diamond Fields- Baseball Youth	5	3
Diamond Fields- Baseball Adult	1.8	2
Diamond Fields- Softball Youth	3.6	0
Diamond Fields- Softball Adult	2.7	7
Rectangular Fields- Soccer Youth	5.6	7
Rectangular Fields- Soccer Adult	2.8	8
Rectangular Fields- Football	1.5	0
Rectangular Fields- Field Hockey	2.1	0
Rectangular Fields- Lacrosse	1.5	0

Figure 34



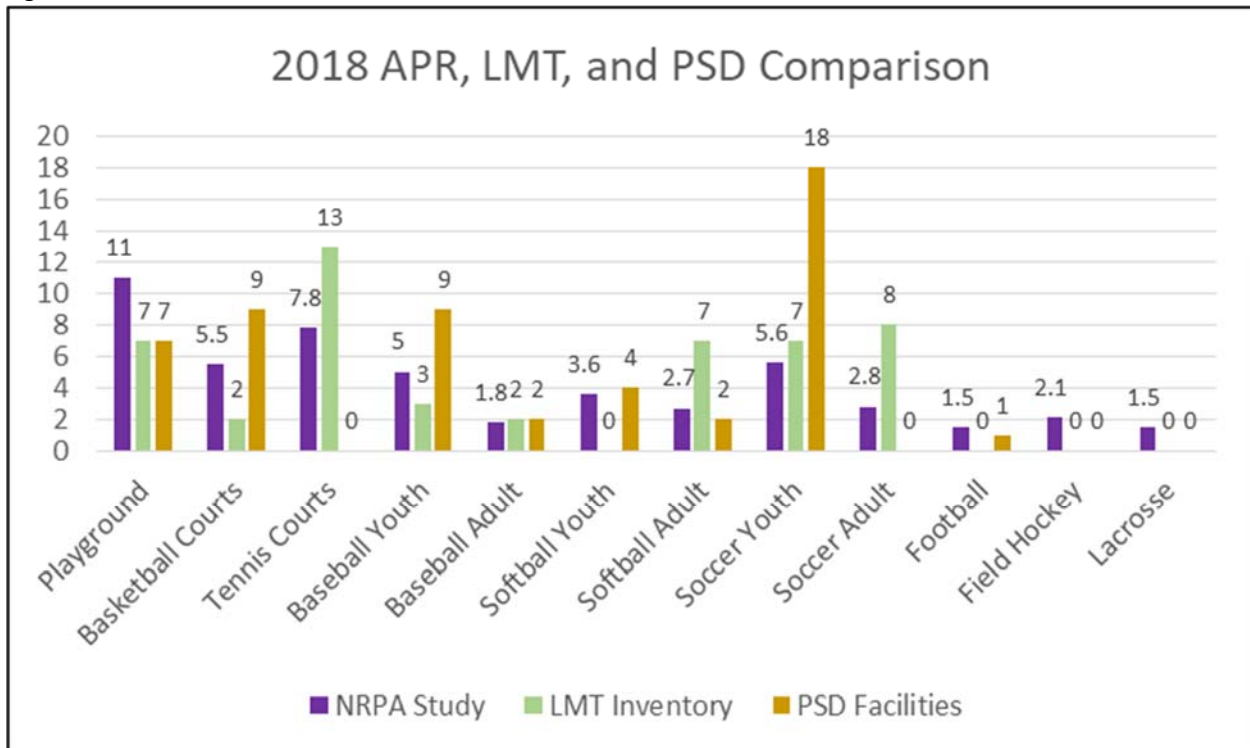
Figures 35 and 36 build on the aforementioned analysis by comparing the Pennsbury School District facilities to the NRPA study and Lower Makefield Township facility inventory. The accessibility of the Pennsbury School District facilities for sport organizations is subject to availability and the school district’s sports schedules. Pennsbury School District is not a parks and

recreation agency and does not need to be analyzed in comparison with the NRPA recommendations for an agency. However, the school district facility inventory matches up fairly well against the NRPA averages. Pennsbury School District exceeds the NRPA average in basketball courts, youth softball fields, and youth soccer fields. As expected, the school district has few to no adult scale facilities in its inventory.

Figure 35

Facility Type	2018 APR Recommendations	LMT Inventory	PSD Facilities
Playground	11	7	7
Basketball Courts	5.5	2	9
Tennis Courts	7.8	13	0
Diamond Fields- Baseball Youth	5	3	9
Diamond Fields- Baseball Adult	1.8	2	2
Diamond Fields- Softball Youth	3.6	0	4
Diamond Fields- Softball Adult	2.7	7	2
Rectangular Fields- Soccer Youth	5.6	7	18
Rectangular Fields- Soccer Adult	2.8	8	0
Rectangular Fields- Football	1.5	0	1
Rectangular Fields- Field Hockey	2.1	0	0
Rectangular Fields- Lacrosse	1.5	0	0

Figure 36

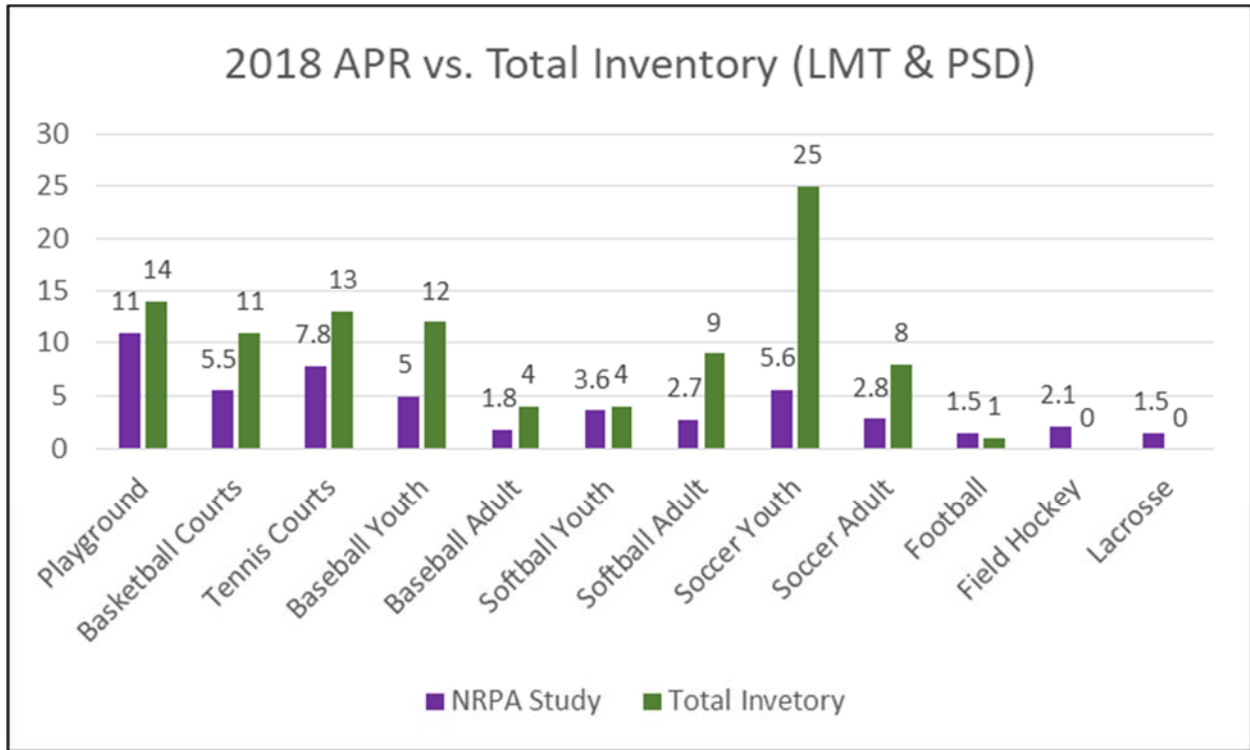


Figures 37 and 38 show the 2018 APR recommendations compared to the total inventory of available recreational facilities in Lower Makefield Township. The total facility inventory includes the facilities owned and operated by the Township as well as the Pennsbury School District. The total inventory of recreational facilities exceeds the APR recommendations for every facility type except for field hockey fields. The total inventory well exceeds the recommendations for basketball courts, tennis courts, baseball fields, and soccer fields. The total inventory is similar in number for playgrounds, youth softball fields, and football fields. While mathematically the total inventory may exceed the national average we acknowledge that scheduling and actual use can greatly affect the quantity of fields available.

Figure 37

Facility Type	2018 APR Recommendations	Total Inventory
Playground	11	14
Basketball Courts	5.5	11
Tennis Courts	7.8	13
Diamond Fields- Baseball Youth	5	12
Diamond Fields- Baseball Adult	1.8	4
Diamond Fields- Softball Youth	3.6	4
Diamond Fields- Softball Adult	2.7	9
Rectangular Fields- Soccer Youth	5.6	25
Rectangular Fields- Soccer Adult	2.8	8
Rectangular Fields- Football	1.5	1
Rectangular Fields- Field Hockey	2.1	0
Rectangular Fields- Lacrosse	1.5	0

Figure 38



## User Matrix Results

The BCPC created a user matrix to acquire information from identified potential user groups on pertinent facility information. The user matrix, administered via e-mail, required the respondent to answer four questions and fill out a spreadsheet. The purpose of the questions was to gather information deemed vital for the analysis, including total number of participants, residential versus non-residential participation, the use of fields or facilities outside of Lower Makefield Township, and if lighting is required for activities to operate. The potential user groups who were administered the user matrix are included in figure 39. The spreadsheet detailed which fields were being used during each season and for how many hours per week. This data was recorded to help identify if any specific field or facility is being overused. Lower Makefield Township surveyed five potential user groups in 2017. More recently, additional potential user groups were identified and the user matrix was sent to nine user groups. The user matrix prompted the respondent to list any use of Macclesfield Park in a separate spreadsheet. Macclesfield Park is the largest facility in the Township by both acreage and field tally. The data for Macclesfield Park was separated out so it could be further evaluated for over utilization. As reflected in the user matrix results, Macclesfield Park is used by the bulk of the Township participants in sport activities and the park is occupied for a significant portion of the total occupied hours.

The user matrix is strictly a tally of facility usage by identified sports organizations. The intent of administering the user matrix was not to capture the use of a facility by the casual user. To understand the full scope of facility use, the Bucks County Planning Commission recommends a statistically valid community-wide resident survey be administered by the Township.

Figure 39

User Groups
LMFA- Lower Makefield Football Association
LMT Pickle Ball Club
Bucks Ultimate Frisbee Camp
Pennsbury Boys and Girls HS Ultimate Frisbee Club
Lower Makefield Rookie Rugby Club
Lower Bucks Lacrosse
YM Tennis (Yardley Makefield)
PAA- Pennsbury Athletic Association
YMS- Yardley Makefield Soccer
Lower Bucks Field Hockey

The user matrix included questions regarding the number of township residents participating in the user groups, facility lighting, and out of Township facility use. The respondent for LMT Pickle Ball Club did not answer any of the questions in the user matrix. The respondent for PAA did not separate out the participation numbers for use of Macclesfield Park and other facilities. The PAA participation rates were only included in the “other facilities” cohort. Of the eight respondents,

three respondents, Lower Bucks Lacrosse, Ultimate Frisbee Club, and Pennsbury Field Hockey use facilities outside of Lower Makefield Township. Five respondents- LMFA, Lower Makefield Rookie Rugby Club, PAA, YMS, and Lower Bucks Lacrosse- require lights to conduct their activities. Only two facilities owned and operated by Lower Makefield Township- Macclesfield Park and the Community Center Complex- are equipped with lighting to operate evening activities.

### **Quality and Quantity**

While a review of the NRPA APR survey as well as the outmoded calculations would suggest that the Township has the required number of fields for various flat field sports, the APR does not account for actual participant enrollment, scheduling, use or maintenance. For instance, the Township cannot currently accommodate field hockey as there are no fields which can be mown to the specific low turf height tolerances needed for field hockey play. Additionally, all U6 and below YMS soccer practice and games are conducted at Edgewood Elementary as they cannot be accommodated at Macclesfield Park due to the total number of program participants versus available fields. The BCPC understands that field configuration at Macclesfield Park is also frequently changed for younger soccer participants in order to accommodate the various levels of participation and new field size regulations as enacted by the US Youth Soccer Organization. All of these factors combined suggest that the need for fields cannot be addressed solely by comparative analysis of national trends but rather, further reinforce that local level survey of actual use and conditions must be performed.

### **Field Condition and Maintenance**

Based on input from user groups who used rectangular fields, there was clearly an expressed need for improving the fields presently owned and used both at the Township and school facilities. All fields reviewed, with the exception of the newly renovated synthetic turf field at Macclesfield Park, are natural grass fields with varying degrees of maintenance and conditions. By in large most fields show signs of excessive use and would benefit from some level of rehabilitation and/or maintenance including but not limited to:

- Drainage improvements; surface and sub-surface
- Top soiling and re-grading
- Turf re-establishment or replacement
- Aeration and incorporation of soil conditioners
- Seasonal resting
- Fertilization and weed control, minimally 4 times annually

Seasonal resting when coupled with proper aeration, seeding and fertilization is perhaps the number one practice to ensure the prolonged life of natural grass fields. This resting enables undisturbed root growth, limits compaction of soil and destruction of grass cover. Embracing this practice however is difficult to employ when additional fields are not available either due to scheduling conflicts or when faced with a deficit in the number of required fields. Based on the analysis this appears to be the case within the Township.



Improving the fields, however, either by conversion to synthetic turf or as natural grass fields with re-construction in combination with improved maintenance, is not the sole answer. Based on the matrix responses, specifically related to Macclesfield Park, it was clear that additional field space was also needed to adequately address scheduling and maintenance needs.

Other limiting factors include the overlap of existing multi-use fields such as “field H” at Macclesfield which hosts both baseball and flat field uses. We also recognize that many sports have now become “year round”; there is no seasonal break to allow baseball for instance, to occupy the same field as soccer. Both teams are now playing at the same time. Furthermore, anecdotal information suggests that differences in foot wear, specifically cleat types, for the different sports, creates unfavorable field conditions through the wear and tear of the field surface. Various sports require different playing surfaces and have different tolerances for surface irregularities. For example, field hockey and soccer require a more even and uniform surface free of ruts and irregularities than football. This significantly impacts field availability and playability.

Based on research by the Synthetic Turf Council, a synthetic turf field can be utilized up to 3,000 hours per year with regular maintenance. The Township has one synthetic turf field at Macclesfield Park and that field was just renovated. While the conversion to synthetic turf does not “add” field square footage per se, it does however hypothetically enable virtually unlimited use of a field. This availability therefore theoretically somewhat eases the “quantitative” need for field space. This is entirely subject to and offset by conflicting scheduling needs amongst various user groups.

With regards to natural grass fields, anecdotal research and studies by the Natural Turf Growers Association, recommends that natural grass fields be used no more than 20-24 hours per week or 680-816 hours per year for a three season period<sup>18</sup>. This hourly use statistic was factored into the analysis and determinations.

### **Field Use**

As noted previously, it is not enough to simply look at the quantity of required fields against a measure of national averages. The NRPA’s overarching guidance on determining the required number of facilities, is rooted in understanding each community’s specific and unique needs.

Based on the user matrices it was evident that Macclesfield Park is the Township’s primary and solitary multi-field, flat field recreational facility. Therefore the hours of use at Macclesfield were tallied to determine the specific hours of use as a function of maintenance and overuse compared to the guidance hours suggested by the Natural Turf Growers Association. The analysis looked to identify overlap uses by groups using the same field albeit at different times. The total hours of use for a specific field within Macclesfield were then divided by the larger of the recommend yearly hours of use (816hrs/year) as suggested by the Natural Turf Growers Association to yield a “use factor” to identify whether a specific field was being overused. The tally did not include the synthetic turf field C.

The overuse of a field as a function of its hourly usage is relevant as it highlights two factors: the field cannot be properly rested/maintained during normal turf growing seasons and there is likely a latent demand for additional fields to accommodate the schedule. As expressed by certain user groups, maintenance at Macclesfield is predominantly focused on simply maintaining playability of the field. Figure 40 below provides the tally of all hours on all fields at Macclesfield Park as currently laid out and generally match the park’s directory sign. Within the chart, any field with a use factor over the value of “1” is considered overused per the Natural Turf Growers Association guidelines.

Figure 40

Field	Total Fall Hours	Total Spring Hours	Total Yearly Hours	Use Factor Total Hrs/816max hrs/yr
Macclesfield C	832	960	1,792	NIC/Synthetic Turf
Macclesfield D	702	810	1,512	1.85
Macclesfield E	450	39	489	0.60
Macclesfield F	702	810	1,512	1.85
Macclesfield G	450	0	450	0.55
Macclesfield H*	390	642	1,032	1.26
Macclesfield I	455	525	980	1.20
Macclesfield J	455	525	980	1.20
Macclesfield K	455	525	980	1.20
Macclesfield K2	455	525	980	1.20
Macclesfield L	455	525	980	1.20
Macclesfield M	455	525	980	1.20
Macclesfield Mini #1	455	525	980	1.20
Macclesfield Mini #2	455	525	980	1.20
Macclesfield Mini #3	455	525	980	1.20
Macclesfield Mini #4	455	525	980	1.20
Macclesfield Mini #5	455	525	980	1.20
MAC A 90' (Baseball)	72	324	396	0.49
MAC B 70' (Baseball)	72	372	444	0.54

\*This field occupies multiple users during the same season. The users are identified as PAA and YMS.

**Participation**

Figures 41, 42, and 43 detail the number of participants in each user group. PAA and YMS have a significantly higher total number of participants than the rest of the user groups. Last year YMS had 2,750 participants and 84% of the participants were Township residents. Only 55% of LMFA participants reside in Lower Makefield Township. The user matrix results state that there are 5,371 participants between the eight user groups. 58% of the total participants between the user groups solely use Macclesfield Park. The sports organizations that use Macclesfield Park are LMFA, YMS, and PAA. The total number of participants who reside in the township is 4,213 people, or 78.4% of the total participants.

Figure 41

User Groups	Resident Participation	Non-Resident Participation	Total Participation
LMFA- Lower Makefield Football Association	429	350	779
LMT Pickle Ball Club	N/A	N/A	N/A
Bucks Ultimate Frisbee Camp	16	4	20
Pennsbury Boys and Girls HS Ultimate Frisbee Club	46	19	65
Lower Makefield Rookie Rugby Club	101	34	135
Lower Bucks Lacrosse	271	139	410
YM Tennis (Yardley Makefield)	123	14	137
PAA- Pennsbury Athletic Association	917	158	1,075
YMS- Yardley Makefield Soccer	2,310	440	2,750

Figure 42

Participation	
Macclesfield Total Participation	3,171
Other Facilities Total Participation	2,200
Total Participation	5,371

Figure 43

Resident Participation	
Total Resident Participation-Macclesfield	2,542
Total Resident Participation- Other Facilities	1,671
Total Resident	4,213
Total Non-Resident	1,158
Total Resident %	78.4%
Total Non-Resident %	21.6%

## **Significant Findings**

The BCPC was tasked with creating a recreation inventory and needs assessment report for Lower Makefield Township. This study set out to identify and analyze the demographic state of the Township, compare the facility inventory to the NRPA recommendations, and administer a user matrix to document the use of the available facilities by sports groups. Research commenced by consulting relevant literature to determine how frequently youths use recreational facilities and how important outdoor recreational activity is to the health of youths. The conclusion of the literature analysis is that the time children spend being sedentary has increased in recent years.

### **Demographics**

Lower Makefield Township is generally experiencing the same demographic trends that are happening in municipalities throughout the lower Bucks County region. After an initial spike in 1990 to 2000, the population growth has slowed and is trending slightly downward. This is also evident in the under 18 years of age cohort which also suggests little to no growth going forward. The average number of children under 18 in households is continuing to trend downward through the 2025 forecast. Among the researched municipalities, Lower Makefield Township has one of the oldest populations. Over the past two decades, the housing stock has maintained a high value and has not fluctuated with the changes in population. Additionally, the population of youths is expected to decrease by 2025. These factors could indicate that there is a financial barrier for young families to move into the Township and start a family. This decline in youths implies that sports organizations with high youth participation now may not experience much future growth beyond current levels due to the high number of participants being Township residents.

### **Facilities Inventory**

Lower Makefield's quantity of specific facilities meets or exceeds the mathematical NRPA recommendations on multiple accounts. Based on the NRPA, the Township is deficient in supplying playgrounds, field hockey fields, and basketball courts. Pennsbury School District facilities in Lower Makefield have several recreational facilities located on site. The facilities owned and operated by the Township in conjunction with the Pennsbury School District facilities exceed all NRPA recreational facility recommendations in terms of quantity, except for field hockey and football fields. However the total number of parks is somewhat below based on the average of agencies surveyed in the NRPA APR. Lower Makefield Township maintains 14 parks and the national average recommendation, based on the Township's population, is 18 parks.

Lower Makefield Township has a regionally high amount of tennis participants. According to the NRPA APR, the number of Township tennis facilities exceeds the average amount of courts recommended to serve the Township population.

Of the existing parks inventoried, only the Snipes Tract appears large enough to accommodate future growth/expansion for full size, regulation (240'x360') flat field, multi-use sports in addition to other facilities. Fred Allan Softball Complex and Greg Caiola Fields might support the

development of smaller fields (180'x270') but further detailed engineering analysis would be required to test the concepts and woodlands may be affected. Based on recent trail and arboretum improvements at Memorial Park, it appears that the implementation of the remaining improvements on the west side of the park, the originally approved "Phase 2", is not likely to happen. This expansion as designed included one large multi-purpose field and three smaller soccer fields. Furthermore this facility is not designed for organized sports use. Lower Makefield Township was awarded a grant for the remaining improvements on the east side of the park, including four tennis courts, a playground, bocce courts, a pavilion, and additional walking trails.

It was noted that several groups like Lower Bucks Lacrosse, Yardley Rookie Rugby and Field Hockey use facilities outside of Lower Makefield or at Pennsbury facilities due to a lack of field availability.

### **Facilities Usage**

While the mathematics and comparison of NRPA standards suggest a sufficient number of fields currently exist, the practicality of scheduling and field overuse appears to be an issue especially when YMS may occupy Macclesfield Park for up to 12 hours on any given Saturday. Based on the hourly use analysis of the various fields at Macclesfield, nearly all fields are being overused to some degree. Fields D & F are being overused by a factor of nearly 2, when compared to the hours of use recommendations as recommended by the Natural Turf Growers Association. This suggests that nearly twice the number of fields would be required to ensure that neither field D or F is overused, can facilitate safe athletic activities, and can be properly maintained and rested. The current use of Macclesfield Park significantly hampers maintenance and precludes the ability to "rest" fields during prime natural grass growing seasons.

While school facilities are available, scheduling is an issue and maintenance is not always consistent creating potential safety issues for users of the fields. Additionally, lighting is a critical component for leagues where coaches and players are participating after work and school hours, especially in the fall season.

Based on the above it is reasonable to conclude that additional fields may be warranted to reduce and or eliminate the overuse of fields at Macclesfield Park and enable other groups to have access to fields to facilitate the participation levels that currently exist and are forecasted to remain fairly constant based on demographic analysis.

## Recommendations

- The Township should conduct a statistically valid resident survey to more thoroughly assess all resident recreational needs and wants. The survey would be sent to all households and utilize an outside agency to conduct and administer the survey;
- The Township already has design plans for Snipes that could be built but may wish to explore alternative designs once the resident survey is completed;
- Based on the demographic analysis and user matrices, the Township should consider the development of at least one additional multi-purpose flat field;
- Additional synthetic turf fields could be installed at Macclesfield to eliminate overuse of the natural grass, but they do not “add” field space per se;
- To serve the greatest number of users and offset the need for increased maintenance, the use of synthetic turf should be given high priority