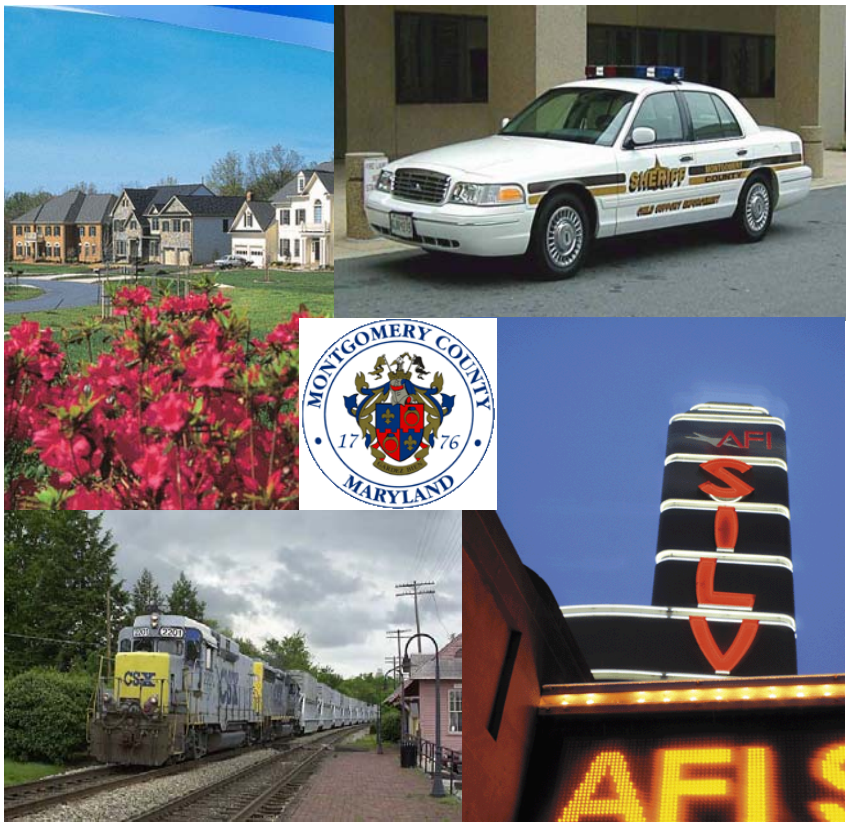

Quality of Life and the Planning Process in Montgomery County

May 2007

Prepared by The George Washington University Capstone Group
May 2007

Brian Beckmann
Nathan Dunlap
Brian Filipowich
Julia Kerson
Nathanial Taylor

Executive Summary

Montgomery County is at the forefront of community-based planning. They have consistently provided forums for resident input at every level of the planning process. Planning is used to incorporate long-term community priorities into government action with the goal of improving life quality for residents. The success of these efforts is dependent on a meaningful tool to assess current life quality and effective implementation. The George Washington University Capstone group constructed a comprehensive definition of Quality of Life (QoL) and recommended ways to incorporate this tool into the current Master Plan process.

Quality of Life:

Exhaustive research on Quality of Life, of both academic works and practical applications, resulted in the construction of nine QoL dimensions. Each dimension represents priority areas that interact with one another to determine life quality. They are as follows:

- **Public Safety**
- **Economy**
- **Health**
- **Natural Environment**
- **Housing**
- **Social Environment**
- **Civic Engagement**
- **Mobility**
- **Education**

Indicators were chosen to measure the current environment within each dimension. Detailed descriptions of the selected indicators can be found in **Appendix A.**

Recommendations for Use:

It is clear that Montgomery County emphasizes community input in their Master Plan process. This practice is grounded in the underlying goal of planning itself—to obtain the highest level of life quality for county residents. In this type of planning the assumption is made that residents and decision makers are aware of both the inputs of Quality of Life and the appropriate ways to measure those inputs. The overarching recommendation of this team is that Montgomery County should **expand their planning process to include a Quality of Life assessment.** In doing so, the County will be able to establish long-term goals in conjunction with government constraints, community desires, and the dimensions of life quality that may need improvement. To achieve this goal we suggest the following steps be taken:

- **Augment the Current Data Collection/Analysis Process:** To facilitate a Quality of Life assessment, we recommend expanding the first phase of the current Master Plan process to include data collection on each of the nine dimensions.
- **Introduce Quality of Life Data Analysis into the Purpose Report:** Establish each dimension as areas to be addressed in amendments to current Master Plans by including them in the Purpose Report structure.
- **Supplement Community Input with Assessments from Community Experts:** Input from experts in each dimension can assist the County in interpreting quantitative data collected in the first stage of the planning process.
- **Monitor Quality of Life Dimensions throughout the Life Span of each Master Plan:** In addition to a complete Quality of Life assessment we suggest that progress in each dimension be measured periodically during the 20-year Master Plan cycle.

Table of Contents

Introduction

Montgomery County has long been a leader in community-based planning. With roughly 930,000 residents spread over 500 square miles, Montgomery County is demographically, as well as geographically, diverse. The County has high density, low density, rural and urban areas populated with a blend of wealthy, poor, young and old people. With such a mixture, it is reasonable to assume that Montgomery County might have trouble creating policies that satisfy the needs and demands of such a diverse citizenry. Yet, the County has consistently provided residents with forums for input at every level of the planning process so that plans better reflect citizen priorities. Nationwide, many other localities have followed Montgomery County's lead and adopted similar programs.

Traditionally, planning is used to incorporate long-term priorities into government action with the goal of improving life quality for residents. Montgomery County has taken this process a step further by emphasizing community-based planning. However, the current process is lacking a comprehensive way to measure the impact of planning initiatives on life quality. Incorporating Quality of Life measures into the planning process provides an additional tool from which to draw planning goals and policy priorities.

In the end, the success of these efforts is highly dependent on both effective implementation and, for the purposes of evaluation, a meaningful assessment tool. **The George Washington University Capstone group was tasked with constructing a comprehensive, functional definition of Quality of Life (QoL) and recommending ways to incorporate this tool into the current Master Plan process.**

Quality of Life

Before defining Quality of Life (QoL) and addressing the role it plays in the Montgomery County planning process an understanding of QoL's theoretical framework is necessary. In many ways the notion of QoL is as old as human society. Whether it is the laws in the Torah or Plato's writings on the republic, individuals and societies throughout history have sought to define what embodies the good life.

Today, academics and practitioners argue that QoL "denotes a set of wants, the satisfaction of which makes people happy."[1] Based on Abraham Maslow's "arena's of happiness" (the self, the other, and the society) [2] theories of Quality of Life tend to distinguish between the physical and psychological.[*] Ben-Chieh Liu, a QoL theorist, says that economic, political, environmental, health, and education are societal factors that comprise the physical. Likewise, the psychological consist of community belongingness, love, affection, esteem, and self-actualization. Liu's widely cited model constructs a Quality of Life curve implying a tradeoff between physical and psychological characteristics. Individual capability constraints result in combinations of the two factors that produce an optimal Quality of Life.[3] Though groundbreaking, Liu's model has no clear role for government action.

[*] Although determining the largely subjective psychological inputs in Quality of Life is the biggest challenge to practical application, theories suggest that assessments without them are inherently flawed.

On the other hand, modern theorist Robert E. Lane, constructs a model that suggests a specific role for government action. Lane theorizes that Quality of Life is made up of Quality of Conditions (the physical) and Quality of Persons (the psychological). The role of government is to affect the relationship between the two notions. The psychological is affected as individuals take advantage of opportunities afforded by their physical environment. The government's role is to provide and promote the use of these opportunities.[4]

This research has important implications for using QoL as a measure of success. Specifically, consideration should be given to both physical and psychological factors. While there is a clear emphasis on the physical dimension, the QoL definition that we have constructed attempts to address all aspects of life quality.

Methodology

Quality of Life has been, and will be, defined and re-defined repeatedly over the years. No one definition is found completely acceptable. Individual communities will have different perspectives on their life quality. These dimensions and their accompanying definitions are the result of extensive research by the George Washington University capstone group. To form this QoL definition the team analyzed conceptual definitions and other measurement efforts. A list of QoL assessments from other localities can be found in **Appendix B.**

We first addressed broad categories of inputs and narrowed them down through focused research. Exploration of the conceptual definitions, as interpreted by academics, identified the physical and the psychological as two realms from which to pull. The next phase of research included examining assessments of QoL in other localities to determine the specific aspects, or groupings of components, used to comprise QoL. Based on this research, the team constructed nine general dimensions that encompass QoL. All aspects of these dimensions were explored. We sought to identify various indicators that best depict an accurate picture of life with respect to each dimension. Team members emphasized common usage, practicality, the extent to which the chosen indicator reflects the dimension as a whole, and relevancy to Montgomery County. That being said, every locality is unique and it may be appropriate to tailor the indicators to reflect characteristics specific to Montgomery County.

The assessment tool that follows is the final product of extensive research and analysis. The dimensions and the indicators selected do not exist in a vacuum. They interact with one another to allow a comprehensive measure of life quality. When considered holistically, the Quality of Life definition can be applied to create a more effective planning policy.

Dimensions of Quality of Life

Public Safety

As mentioned above, Quality of Life for an individual is composed of the physical and the psychological. Physical wants need to be met, yet individual perceptions of life quality will vary. One important dimension of life quality that crosses this boundary of physical and psychological is Public Safety. The Public Safety dimension of Quality of Life includes the raw numbers of crime rates, police and fire dispersion, and residents' perception of how safe they feel. The Public Safety dimension sets the tone for a community. A community that is safe and feels safe is the rich dirt in which a vibrant community can grow. Without a safe community, normal activities become difficult and the other dimensions are negatively impacted.

The indicators for this dimension are **violent crime rate, property crime rate, percent of residents who feel safe walking alone at night/day, per capita police presence, fire response time, police response time,** and **paramedic response time**. These were chosen to cover crimes committed, perception of safety, allocation of resources, and performance of public safety officials. Violent and property crime rates are simple measures of crime in a community. Percent of residents who feel safe walking alone at night/day is a measure of residents' perception of crime. Rates may be low, but if residents feel unsafe then Quality of Life suffers. Per capita police presence measures the allocation of resources, while police, fire, and paramedic response time encompasses the performance of public safety officials.

Economy

Quality of Life is directly tied to the strength and robustness of the local economy. Not only does a more vibrant and diversified mix of economic activities provide opportunities for productive employment, but it also creates the capacity to fund public services. As reported in the *Journal of Constitutional Political Economy* an increase in economic infrastructure necessarily increases the standard of living. A community is healthier and happier when public services are adequately provided for and when residents can undertake substantive work for which they are well compensated.[5] For this reason, a strong economy is correlated with a healthy workforce and broad individual prosperity.[6] Ultimately, the economic vitality of an area is not only a result of a good quality of life—it is a cause of it.

The indicators chosen for this dimension are **unemployment rate, economic vitality, share of population living in poverty, personal debt, per capita job growth,** and **household income disparity**. These indicators were selected because they provide a balance between the economic opportunities available and the economic boundaries in place. Unemployment rate is reflective of the accessibility of job opportunities within a given community. Economic vitality addresses the health and strength of the local economy. Share of population living in poverty provides a picture of a community's average standard of living. Personal debt helps quantify the financial stress, and therefore QoL, of each resident. Per capita job growth measures the annual expansion of the local economy as well as the number of new employment opportunities created. And household income disparity highlights the difference in incomes between the community's richest and poorest people.

Health

An optimal Quality of Life mandates a complete state of physical and mental well-being. This state of being extends far beyond the absence of disease to include a variety of elements that impact both individual and community. Aside from the obvious benefits to the individual, health status is directly linked to productivity. As reported in *The Journal of Occupational and Environmental Medicine*, health problems produce indirect and direct costs for employers via health care and decreased performance related to absenteeism and disability.[7] Similarly, scholars from the National Bureau of Economic Research identify health as a significant component of human capital. A healthy workforce correlates to economic growth and prosperity.[8] The individual physical and mental benefits of good health, combined with economic community benefits, makes measuring health a necessity in assessing Quality of Life.

The indicators chosen for this dimension are **percent of uninsured residents, percent of mothers receiving adequate prenatal care, percent of children with up-to-date immunizations, prevalence of specific health conditions (diabetes, cancer, heart disease, severe asthma, and obesity), and the per capita number of general physicians.** These were selected after a careful review of previous health quality assessments. They emphasize both accessibility and the use of preventative care. Uninsured residents are far more inhibited by expensive medical care and thus are less likely to seek treatment for conditions before they become life threatening. The per capita number of general physicians indicates accessibility to care. Similarly, measures of adequate pre-natal care and immunization rates emphasize the extent of preventative care. Prevalence of specific health conditions is meant to measure the actual health of area residents.

Charlotte, North Carolina: A Quality of Life Community

Many counties and cities use various indicators and dimensions to determine the state of the community. Some communities are more thorough and deliberate than others. For example, over the last 7 years the city of Charlotte has conducted a biennial review of city neighborhoods. Using four dimensions—social, physical, crime, and economic— and nineteen indicators, the reports have created a successful QoL snapshot of the community. Over time this has enabled Charlotte to analyze trend data to create a more vibrant and visible community.

Natural Environment

The state of the natural environment strongly impacts individual QoL. From the air they breathe to the water they drink, the quality of the natural environment has a direct connection to personal life quality. Low air quality has been directly linked to health problems such as asthma, while low water quality can lead to the spread of diseases like Giardiasis.[9] Open space allows people to exercise and enjoy the outdoors, improving both their mental and physical well-being. A healthy natural environment promotes a vibrant community.

The indicators chosen for this dimension are **per capita green space, air quality, water quality, annual number of noise complaints,** and **ambient noise level**. The amount of green space per citizen provides a picture of natural space available to members of the community to enjoy and use at their leisure. Air quality and water quality are standards that are set and monitored by the EPA. They were chosen because they have the greatest affect on the community as low quality is correlated with significant health problems. We chose two indicators for noise to give a proper assessment of noise pollution and its effect on the natural environment. Ambient noise level measures the general level of noise pollution while the number of annual noise complaints measures the community's perception of noise levels.

Housing

Housing is fundamental to Quality of Life. The ability to secure a safe and affordable place to live is essential to all residents. By providing physically appealing, structurally sound and financially manageable housing options, local governments can increase the standard of living and QoL in their area.[10] Ultimately, there are stressors associated with housing (space, affordability, repair costs, etc) and these directly affect an individual's Quality of Life.

The indicators for this dimension are **new housing units added, housing tenure type, floor area per person,** and **percent of income spent on housing**. These indicators recognize how physical issues and financial concerns can combine to create stress. New housing units measures a community's growth, demand for housing, and an area's popularity. Housing tenure type provides a ratio of homeowners to renters in a community. Floor area per person addresses the issue of average per capita living space available in an area. Finally, percent of income spent on housing measures the average amount of financial stress housing costs place on residents of the community.

Social Environment

As we have highlighted a high Quality of Life encompasses many dimensions. Residents need to feel safe, have economic opportunities, a place to call home, and a healthy environment. Additionally, it is important that the social environment is diverse and healthy. The Social Environment is relatively difficult to quantify. In short, it is the external context in which residents live, work, and play. A neighborhood with a strong social network will have many opportunities for residents to participate in the community. This includes entertainment and nightlife options, parks for leisure activities, and arts and cultural events. An active social environment defines a unique community identity and promotes high life quality.

The indicators for this dimension are **median age of the population, average distance to a park, yearly attendance at Montgomery County public parks,** and **share of population attending sporting, cultural, and artistic events.** These indicators were selected to capture the vibrancy and individual character of Montgomery County. Median age measures diversity of neighborhoods within a community. Average distance to a park addresses the dispersion of resources. Yearly attendance at public parks measures relevancy of parks. Share of population attending an event measures the activity of the residents and the opportunities in the community.

Civic Engagement

Quality of Life is not derived from individual experience alone. Personal life quality is very much impacted by the community environment. This dimension seeks to incorporate the means by which individuals actively participate in the construction of a single community character. It is this cohesive action that bonds residents as members of a distinct group, a group that transcends racial or religious differences. Civic participation is associated with benefits at both the individual and community level. For the individual, as Harvard Professor Robert Putnam proclaims, "networks of civic engagement foster sturdy norms of generalized reciprocity and encourage the emergence of social trust."[11] Putnam continues on to identify a myriad of community wide benefits of civic engagement including lower crime rates, better schools, more effective government, and faster economic development.[12]

The indicators selected to measure civic engagement are **percent of eligible residents registered to vote, percent of population with public library membership, number of hours volunteered on an annual basis, generosity index,** and **social capital.** Collectively, these indicators measure the various ways in which individuals participate in the public realm. The emphasis in indicator selection was to capture both political and social forms of civic engagement. Political participation is represented in voter registration. The remaining indicators assess community buy-in through monetary donations, volunteer hours, and basic levels of trust among community members. The final indicator, public library membership, measures one method by which local governments encourage social engagement.

Mobility

Human beings are animals on the move. As individuals we travel thousands of miles a year, moving from work to home to baseball games to restaurants to parks. This movement puts a strain on the transportation network. As time progresses more cars are driven on the road, public transportation ridership goes up, and resources too often fall short of expectations. A paralyzed transportation network can quickly diminish residents' Quality of Life. A highly mobile community will have a multi-modal system, including auto-accessibility, public transportation, bicycle use, and walkability.

The indicators for mobility are **average commute time, average annual amount of auto traveler delay per person, number of residents within a 10-minute walk of public transport, share of population who ride public transportation,** and **pedestrian friendliness index.** These indicators were chosen to measure the viability of the transportation network. Average commute time and average annual number of hours of delay are measures of traffic overload. An increasing average commute time and auto delay indicates a troubled transportation network. Number of residents within a 10-minute walk of a public transport stop and percent who ride public transportation measures use and accessibility. The pedestrian friendliness index is an attempt to measure how accessible roads are to foot traffic.

Education

A good education is the cornerstone of a high Quality of Life. A strong education system powers the local economy by providing graduates with the basic knowledge and skills necessary to enter the workforce. In addition, an excellent educational system leads students to seek higher education, which in turn raises technological discovery, produces higher paying jobs, and allows citizens to take a more active role in their community's economy. The state of the educational system touches nearly every aspect of a community from healthcare to government.

To get a broad picture of the state of education, we chose four indicators: **parental involvement, high school drop out rate, pre-primary education enrollment,** and **test score achievement**. High levels of parental involvement prevent behavioral problems and spurs academic success. If involvement is high, then it is more likely that parents value the education their children are receiving. The high school drop out rate shows both the value that students place on their own education and acts as a predictor for near future economic conditions. Pre-primary education is predictive of future educational success. Finally test scores give the evaluators an opportunity to make comparisons between all levels. By using standardized tests student achievement can be compared at the school, county, state, and national level.

Analysis of Current Master Plans and Process

As highlighted above, the nine Quality of Life Dimensions need to be integrated into the planning process. Currently, Montgomery County Master Plans have a strong focus on mobility, natural environment, and social environment, yet fail to incorporate the other dimensions. The policy recommendations and the structure of Master Plan documents demonstrate significant bias towards the three aforementioned dimensions. [†] To improve all areas of QoL Montgomery County can change the Master Planning process to ensure that all dimensions receive adequate attention.

This analysis looks at three Master Plans to determine the focus of current planning efforts: The Shady Grove Study Area Master Plan, The Bethesda-Chevy Chase Master Plan, and the Cloverly Master Plan. These three Plans represent the diversity of Montgomery County—both the urban core and rural suburbs. To determine the focus of each plan the policy recommendations from the December 2002 Master Plan Status Report were sorted into the nine QoL dimensions. For this purpose, if policy recommendations affect more than one dimension they may be cross-listed.

The analysis demonstrates that three QoL dimensions receive the majority of attention while the others are largely neglected. As seen in Table 1, mobility (76 policy recommendations), social environment (48 policy recommendations), and natural environment (22 policy recommendations) are affected 146 times.[‡] Other dimensions, such as Public Safety and Health, receive little or no attention. In the three master plans, health, public safety, and civic engagement received less than five policy recommendations.

Table 1: Master Plan Summary Data

	Pub. Safety	Economy	Health	Environment	Housing	Social	Civic Eng.	Mobility	Education
Shady Grove	0	4	0	5	0	12	0	28	6
Bethesda -CC	4	7	2	11	5	27	0	33	1
Cloverly	0	2	1	6	0	9	0	15	1
Total	**4**	**13**	**3**	**22**	**5**	**48**	**0**	**76**	**8**

One reason for the current Master Plan emphasis on mobility, natural environment, and social environment is that these are the dimensions most affected by infrastructure projects. In turn, these projects are directly related to the Capital Improvements Plan (CIP), which receives regular

[†] Of the three types of plans—Master Plans, Sector Plans, and Functional Plans—the incorporation of the Quality of Life dimensions is only necessary in the master plans because these are an all encompassing vision of the entire community. A Sector Plan, which often focuses only on a small area such as a community business district, need not consider all nine dimensions. Similarly, a Functional Plan is used to target one specific aspect of the community, such as transportation or environmental systems, so it would not be appropriate to consider all nine QoL dimensions. Conversely, Sector and Functional Plans could be used as tools to target areas or community characteristics that are lacking in one dimension.

[‡] These three dimensions were affected more times than the total of policy recommendations (131) because some recommendations are cross-listed and affect more than one dimension.

budgetary attention and new project proposals every two years. Since the CIP focuses on building projects, infrastructure-related QoL dimensions receive significant attention.

Along with the CIP, the structure of the Master Plan Status Report reinforces this narrow focus. In the report each plan is summarized with six tables: *policy recommendations, public facilities projects, environmental projects, transportation projects, recommendations made after plan adoption, and the status of ongoing related reports*. Two of these six tables, environmental projects and transportation projects, explicitly focus on two of the QoL dimensions (mobility and natural environment). Policies directed at the other seven dimensions are either encompassed within these tables or not covered at all.

Furthermore, the Master Plan documents follow the trend of only focusing on a few dimensions. Substantive sections include: *land use and zoning, transportation plan, environmental resources plan, communities facilities and needs plan, and historic resources*. Sections of the Master Plan are devoted entirely to the natural environment and mobility dimensions while other dimensions are either buried in the report or are not mentioned at all. Below, Table 2 demonstrates that in the Bethesda – Chevy Chase plan the transportation and natural environment dimensions receive their own section, while housing (housing development objectives) is listed as a secondary subset. Ideally, each QoL dimension should have its own section in Master Plans.

Table 2: Current Master Plan Table of Content

• Visions and Concepts o Goals and Objectives o Development Levels and Location policies ▪ Development levels objectives ▪ Employment development objectives ▪ **Housing development objectives** • Land Use and Zoning o Areawide land use guidelines ▪ Green Corridors Policy ▪ Special Exceptions ▪ Large Land Users ▪ Conservation Areas o Specific areas o Other intra-plan sectors o Federal employment centers	• **Transportation Plan** o Mobility Plan ▪ Public Transportation ▪ Park n' rides ▪ Bike and Pedestrian Paths o Highway System Plan ▪ Highway improvements ▪ Planned Highway projects ▪ Future Highway needs ▪ Street and Highway Plan o Transportation Analysis ▪ Areawide analysis ▪ Patterns f localized congestion • **Environmental Resources Plan** o Natural Features o Water and Air ▪ Water: Quantity and Quality ▪ Noise and Air

Options for Moving Forward

A holistic approach is necessary to fully integrate QoL into the planning process. Plans should target all nine dimensions of QoL: **public safety, the economy, health, the natural environment, housing, the social environment, civic engagement, mobility, and education.** As was described in our assessment section, Master Plans in Montgomery County tend to focus on the mobility, natural environment, and social environment dimensions. Consequently, the other six dimensions do not receive adequate attention.

We understand that changes in the process need to be made to fully incorporate QoL. What follows is a number of recommendations on how Montgomery County can integrate Quality of Life into the planning process.

Recommendation #1

- ***Augment the Current Data Collection and Analysis Process***

The first step of the Master Plan process is collecting both qualitative and quantitative data. Both hard data and community input should be collected for each dimension.[§] Currently, the main subject areas listed in the Master Planning Process document for data collection are: *community and land use analysis, design and historic preservation studies, economic and market analysis, community facilities analysis, transportation analysis, environmental analysis, and housing and residential analysis*.[13] Aspects of the mobility, economy, natural environment, and housing dimensions already have partial methods in place to gather and analyze pertinent information, while other dimensions do not.

To understand where Montgomery County stands and—by implication—where it needs to go, a detailed plan should be developed to collect and analyze data related to each of the nine dimensions. We have proposed several indicators for each dimension that the planning commission can use to assess that aspect of QoL. We suggest a review of the current data collection methodology to determine if it allows for a useful QoL appraisal. The data collection and use of the indicators at the beginning of the process would result in a thorough report of how the master planning area fares along all nine dimensions. This complete picture will set the stage for the rest of the process.

Recommendation #2

- ***Introduce Quality of Life Data Analysis into the Purpose Report***

The second stage of the master planning process includes drafting the Purpose Report and Outreach Strategy. The Purpose Report establishes the issues and areas on which the new plan amendments will focus. If QoL is to become a major contributing factor in the planning process it is crucial that all QoL dimensions become part of the Purpose Report. Analysis of the data collected will indicate which dimensions require focused attention. For instance, if two of the nine dimensions are found to be lacking through the data collection, the Purpose Report will

[§] Quantitative data includes indicators that are collected to measure the dimensions. On the other hand qualitative data is collected from community input in the form of surveys, focus groups, planning workshops, and interviews.

concentrate on the two deficient areas. As a result, the Purpose Report will help establish targets for QoL improvement, thereby providing essential information to integrate QoL.

Recommendation #3

- ***Supplement Community Input with Assessments from Community Experts***

In addition to incorporating community input in their QoL assessment, the planning commission should seek input from individuals and groups that have experience and expertise along all nine quality of life dimensions.[14] For example, if the Purpose Report targets housing as a dimension in need of improvement, it is particularly important for the Outreach Strategy to pinpoint community housing experts for input into the planning process. The information provided by these community experts will be another safeguard to ensure that the planning commission is concentrating its efforts on the proper dimensions of QoL.

Recommendation #4

- ***Monitor Quality of Life Dimensions throughout the Life Span of each Master Plan***

Once a Master Plan is adopted, dimensions must remain incorporated throughout the implementation phase to ensure successful improvements in QoL. Master Plans are adopted every twenty years in Montgomery County. This time span is too long of a stretch to go without looking at changes in each dimension. In order to adequately affect QoL in the community, a complete data collection effort for all dimensions should occur twice, at equal intervals, during each Master Plan's life span. We suggest that for a twenty-year plan, a complete assessment occur at years seven and fourteen. At that point, enough time will have elapsed to allow for the plan to be implemented and changes to be recognized. Montgomery County would then be able to use the information to amend the Master Plans to include appropriate policy recommendations. In addition, Montgomery County's Capital Improvements Program looks forward in six-year increments, with consideration biennially. Although CIP evaluation will not line up with periodic QoL assessments, enough time will have elapsed for improvement projects to be implemented and their contribution to QoL known.

Over the years, comprehensive planning across the globe has sought to maximize efficiency by emphasizing community participation. If the ultimate goal of long-term planning is to ensure an optimal Quality of Life, then community input is essential. Leaders in community-based planning are realizing that it is difficult to improve Quality of Life without a way to measure it. In this report, we have provided a means for assessing Quality of Life for the purposes of both planning and evaluation. Awareness of current life quality will assist Montgomery County in both evaluating the success of past efforts and creating more effective Master Plans in the future.

Appendix A: Detailed Indicator Description

PUBLIC SAFETY

1. Violent Crime Rate:

Unfortunately violent crime knows no boundaries. A direct measure of resident safety, Violent Crime Rate is the prevalence of violent crime as compared to population size. High crime in a community may be indicative of problems with adequate police facilities or neighborhood trust, each of which greatly influences quality of life. Violent Crime Rate is a measure of violent crimes (assault, rape, murder, etc…) in a given area, and is often used to compare similar jurisdictions pr the same community over time. When used as a baseline to measure future performance, the Violent Crime Rate indicator gives the planning commission insight into a community's progress towards providing a safe environment necessary for high life quality.

Examples of Practical Applications:

- Anchorage, Alaska Indicators

2. Property Crime Rate:

For a community to establish a high quality of life, residents need to feel safe. Contributing to that sense of safety is a low Property Crime Rate (the number of property crimes—taking of someone's property: burglary, car theft, etc—per 1,000 residents). As recognized by Spokane County, Washington "The taking of other's property causes many harmful consequences: loss of use from the item stolen, damage caused to one's emotional attachment to the item(s) stolen, the threat of harm to one and one's family's during the theft, recurring fears of the event or its possible repeat, and often a diminished trust in one's fellow citizens." Furthermore, a high Property Crime Rate negatively impacts residents as the city is forced to utilize additional scarce resources for law enforcement.

Examples of Practical Applications:

- Anchorage, Alaska Indicators
- Community Indicators Initiative of Spokane County, Washington

3. Per Capita Police Presence:

Per Capita Police Presence is a measure of the number of policemen per thousand residents. Note that localities with larger populations sometimes use police presence per 10,000 residents. This indicator has implications for feelings of public safety that stem from both police visibility and effective crime fighting. Though correlation between crime rate and number of police officers is relatively weak, a strong police presence increases perceptions of public safety. In addition to actual reductions in crime, this indicator is appropriate to the extent that feelings of safety promote high life quality.

Examples of Practical Applications:

- The North West Borough of Alaska Indicators
- Palo Alto, California Indicators

4. Percent of Residents Who Feel Safe Walking Alone at Night/Day:

Public safety is not just raw crime rates; it also encompasses perception and direct experience with criminal behavior. If residents don't feel safe, their quality of life is diminished. Thus it is important to know how residents perceive the impact of crime in their lives. Percent of Residents Who Feel Safe Walking Alone at Night/Day is typically measured through a community wide survey. Individual feedback ensures an accurate assessment of this highly qualitative indicator.

Examples of Practical Applications:

- San Francisco, California Indicators

5. Fire Response Time:

Fire Response Time measures the average amount of time it takes for fire fighters to respond to a call. This indicator provides a measure of fire service distribution. Poor response time indicates that firefighting resources are poorly allocated within the community. When tagged to a county/state baseline, decision makers are able to understand how well a neighborhood is served by the Montgomery County fire department.

Examples of Practical Applications:

- Lawrence, Kansas Indicators

6. Police Response Time:

Police Response Time measures the average amount of time from receipt of a high-priority call to police arriving on scene. This indicator measures police service distribution within a given locale and demonstrates the level of community involvement of that police force.

Examples of Practical Applications:

- San Francisco, California Indicators

7. Paramedic Response Time:

Accidents happen, fires break out, and crime occurs. These situations are inevitable, thus it is important for paramedics to quickly respond to a call. Measuring the average amount of time from receipt of a call to paramedics arriving on the scene provides a measure of paramedic distribution across a community. This determines if a locale is being properly served.

Examples of Practical Applications:

- St. Paul, Minnesota Indicators

ECONOMY

1. Unemployment Rate:

The Unemployment Rate is the number of people in an area that do not have a job divided by the eligible labor force. This indicator is appropriate for its implications on both individual life quality and economic health of the community as a whole. Employment allows individuals to better match personal preferences to promote a healthy economy and a satisfied resident base. This measure can also represent the success of government economic policies. Unemployment is largely the result of structural imbalances in the socio-economic system that needs to be addressed at a policy level in each community.[15] Therefore, an area that has low unemployment

is likely to have a robust local economy and effective economic policies. These factors combine to correct for any structural imbalances in the system, thereby allowing more people to benefit from the economic opportunities that are available.

Examples of Practical Applications:

- The Fargo-Moorehead, Minnesota Community Quality of Life Project
- Jacksonville, Florida Community Council Quality of Life Progress Report
- The Boston, Massachusetts Indicators Project

2. Economic Vitality

The Economic Vitality of an area is an indicator created by combining three distinct economic measures: change in median income; percentage of people receiving food stamps; and change in residential house value. By using this three-pronged approach to determining the strength and vitality of a community's economy, one can avoid the bias towards high wealth neighborhoods that accompanies the use of single-variable measures.[16] The combination of change in median income, percentage of people on food stamps and change in residential house value gives a true picture of the areas economy. This has been a proven method before, and it accurately trends with analysis of Quality of Life.

Examples of Practical Applications:

- Charlotte, North Carolina Quality of Life Study

3. Share of Population Living in Poverty

This indicator measures the percentage of the population with a household income below the federal poverty level (which varies by family size). The federal poverty level, determined annually by the Department of Health and Human Services, is based on a basket of goods and services deemed essential for the most basic standard of living. This is a useful indicator because it measures a community's standard of living. High poverty levels are synonymous with poor quality of life, deprivation, malnutrition, illiteracy and low human resource development.[17] Therefore, an area that has a high level of poverty generally suffers from low Quality of Life. Additionally, this is a key indicator of progress, employment and family income in a community.

Examples of Practical Applications:

- State of Georgia Community Indicators Program
- The Boston, Massachusetts Indicators Project
- Jacksonville, Florida Community Council Quality of Life Progress Report

4. Personal Debt

Personal Debt is measured as the average debt held by each person in the community. This is a useful indicator because it serves as a measure of the financial stress each resident faces. Additionally, debt level is reflective of economic strength because a high level of personal debt indicates that personal earning power in a given area does not trend with cost of living. Individual life quality is impacted by personal debt in the form of enhanced financial burdens and the stresses that are associated with it. In essence, as personal debt increases so does individual stress and, generally, Quality of Life is diminished.[18]

Examples of Practical Applications:

- Saskatchewan, Canada Quality of Life Measures

5. Per Capita Job Growth

Job Growth is a measure of the number of new jobs created in an area in the past year divided by eligible labor force. This is a useful metric because it serves as an indicator of the growth of the local economy. As job growth in an area increases, the economic opportunities available to the residents increase as well. With more choices and money infused into a community, the economic stress associated with unemployment, debt and poverty are mitigated and Quality of Life increases.

Examples of Practical Applications:

- Polk County, Florida Quality of Life Indicators
- Healthy Valley, Connecticut Quality of Life Indicators
- The Boston, Massachusetts Indicators Project

6, Household Income Disparity

Household Income Disparity is the difference between the incomes of the community's richest and poorest people, as measured by the amount of household income earned over one or more decades. Income disparity reflects an inequitable distribution of resources which directly limits individual achievement. For example, income plays a large role in the accessibility of educational opportunities. Measures of Household Income Disparity can also highlight the prevalence of poverty and poverty-related problems. A growing gap between the socioeconomic classes threatens the long-term stability of the economy, and can intimately affect Quality of Life.

Examples of Practical Applications:

- Maine Development Foundation
- The Boston, Massachusetts Indicators Project

HEALTH

1. Percent of Uninsured Residents:

The percent of uninsured residents is a measure of residents without either public or private medical coverage. Individuals without healthcare are at risk for simultaneous financial and health crises. A 2003 meta-analysis in *Medical Research and Review* verified the link between health insurance coverage, improved health, higher labor force participation, and higher income.[19] This analysis also found that populations without health insurance suffer higher mortality rates and receive less preventative care. For example, a 2000 *Journal of the American Medicine Association* article identified that uninsured adults were much more likely to not have had a routine checkup in the previous 2 years than were insured adults.[20] Additionally, individuals without health care are often forced to use much needed emergency room resources for non-emergency conditions. The implications on a quality of life assessment are profound, and a measure of the uninsured population can provide lawmakers with a better understanding of the adequacy of the local emergency facilities.

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project
- Community Indicators Initiative of Spokane County, Washington
- Dallas, Texas Indicators
- 2006 Osceola County, Florida Report Card

2. Percent of Mothers Receiving Adequate Prenatal Care:

This indicator is defined as the percent of pregnant women receiving prenatal care, as measured by the widely accepted Kessner Index for adequate prenatal care.** The Kessner Index is based on the number of prenatal visits in relation to the gestation period and is illustrated below in a table, from the 1973 article by the National Academy of Sciences, Institute of Medicine.[21]

The Kessner Index

Adequacy of Care	Gestation (weeks)[d]		Number of Prenatal Visits
Adequate[a]	13 or less	and	1 or more, or not stated
	14-17	and	2 or more
	18-21	and	3 or more
	22-25	and	4 or more
	26-29	and	5 or more
	30-31	and	6 or more
	32-33	and	7 or more
	34-35	and	8 or more
	36 or more	and	9 or more
Inadequate[b]	14-21[c]	and	0 or not stated
	22-29	and	1 or less or not stated
	30-31	and	2 or less or not stated
	32-33	and	3 or less or not stated
	34 or more	and	4 or less or not stated
Intermediate	All combinations other than specified above		

[a] In addition to the specified number of visits indicated for adequate care, the interval to the first prenatal visit has to be 13 weeks or less (first trimester)

[b] In addition to the specified number of visits indicated for adequate care, all women who started their prenatal care during the third trimester (28 weeks or later) are considered inadequate.

[c] For this gestation group, care is considered inadequate if the time of the first visit is not stated

[d] When month and year are specified but day is missing, input 15 for day

This indicator is included in the health dimension of our quality of life definition because it represents the health conditions of newborns, which has implications for their health as they continue into adulthood. Adequate prenatal care provides the opportunity to detect and treat complications in the health of both the child and mother. Adequate prenatal care has also been

** The Kotelchuck Index is a second widely accepted measure of adequate prenatal care and is used by some of the cited applications.

linked to a reduction in low-birth weights and infant mortality.[22] In that capacity, adequate prenatal care increases the likelihood of healthy conditions for both mother and baby.

Examples of Practical Applications:

- 2006 Osceola County, Florida Report Card
- Dallas, Texas Indicators
- The Boston, Massachusetts Indicators Project

3. Percent of Children with Up-to-Date Immunizations:

This indicator is defined in conjunction with the Center for Disease Control and Prevention's National Immunization Survey.[23] The National Immunization Survey collects data on vaccination of children ages 19-34 months at the state and local level. We recommend that the results of this survey be included in QOL assessments.

Vaccinations are a highly cost effective tool to prevent a variety of debilitating diseases including measles, hepatitis B, and tuberculosis. For example, A *Public Health Reports* study found that an estimated 24 million cases of measles were averted in the first ten years after the vaccination was widely distributed.[24] The use of vaccination rates as an indicator of Quality of Life is justified by the assertion that living conditions are improved as risk of disease is minimized.

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project
- 2006 Osceola County, Florida Report Card
- Hennepin County, Minnesota

4. Prevalence of Specific Health Conditions:

In examining previously applied Quality of Life assessments it is clear that some analysis of specific health conditions is appropriate. While each area of interest has tailored its assessment to conditions of concern, rates of diagnosis for diabetes, cancer, heart disease, severe asthma, and obesity are consistently used as indicators of general community health. Low rates of disease are demonstrative of improvements in both public health practices and lifestyle choices for residents.

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project
- Community Indicators Initiative of Spokane County, Washington
- 2006 Osceola County, Florida Report Card
- Dallas, Texas Indicators

5. Per Capita Number of General Physicians:

This indicator is defined as the number of licensed general physicians per 1,000 residents. While many of the previous applications studied include some measure of the number of physicians, they tend to vary with respect to the type of physician included in the calculation. Some areas distinguish general physicians from specialists while others include a count of the total physician population. In this case, the decision to use general physicians only is grounded in the emphasis on primary doctor-patient interactions and preventative health care.

This indicator is reflective of the accessibility of health care. An environment in which residents receive medical treatment with relative ease and convenience promotes healthy living and a higher quality of life.

Examples of Practical Applications:

- Community Indicators Initiative of Spokane County, Washington
- 2006 Osceola County, Florida Report Card
- The Metropolitan Philadelphia, Pennsylvania Indicators Project

NATURAL ENVIRONMENT

1. Per Capita Green Space

Per Capita Green Space is the acreage of parks, golf courses, and other open spaces available for public use per 1000 residents. The amount of green space in urban areas influences the quality of the urban environment for residents. Green spaces offer recreational opportunities and contribute to the aesthetics of the environment. In addition to the recreational benefits of green spaces, an *Ecological Economics* journal article identified a number of different ecosystem oriented benefits including: air filtering, micro-climate regulation, noise reduction, rainwater drainage, and sewer treatment.[25] The personal and environmental impacts of green space promote high life quality for the entire community.

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project

2. Air Quality – Comparisons to National Standards

Air Quality is measured by the amount of pollutants in a community's air. It is negatively effected by emissions from mobile and point sources, which are directly linked to energy consumption, environmental policy, city density, use of motor vehicles, and concentration of industries. Montgomery County already tracks ground level ozone, radon, and carbon monoxide levels and compares them to EPA standards.

Examples of Practical Applications:

- Bloomington, Indiana Indicators

3. Water Quality –Total Maximum Daily Load (TMDL)

Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a water body can absorb and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. It must also account for seasonal variation in water quality. Water quality standards are set by States, Territories, and Tribes and they identify the uses for each waterbody (for example: drinking water supply, contact recreation (swimming), and aquatic life support.). TMDL is an appropriate measure because it is approved by the U.S. Environmental Protection Agency (EPA) and because it is a uniform measure of quality for all types of water bodies.

Examples of Practical Applications:

- Jurisdictions are required to have TMDL's for the local area approved and reported annually to the EPA. All fifty states and the District of Columbia are required by law to participate in this program.

4. Annual Number of Noise Complaints

As recognized by Montgomery County: "Excessive noise from transportation, human activity, amplification and mechanical equipment interferes with the quiet enjoyment of property and the lawful conduct of business, generally diminishing the Quality of Life in the community. It raises the stress level of individuals and communities. Continued growth and urbanization, particularly in mixed-use zones, often creates an inherent conflict of equities." The number of noise complaints does a good job of modeling the interpretation of noise within the community.

Examples of Practical Applications:

- Montgomery County, Maryland Indicators
- Sunnyvale, California Indicators

5. Ambient Noise Level

The ambient noise level is defined by Federal Standard 1037C as, "the level of acoustic noise existing at a given location."[26] It is typically measured in decibels with a sound level meter. This measurement is meant to complement the indicator of "number of noise complaints" and is used to track the effectiveness of the current noise ordinances in Montgomery County. Together, ambient noise level and the number of noise complaints give a broader picture of noise pollution in Montgomery County. Exposure to loud noises causes various health problems and disrupts the natural environment, both of which negatively impact Quality of Life.

Examples of Practical Applications:

- Montgomery County, Maryland Indicators
- Newport Beach, California Indicators

HOUSING

1. New Housing Units:

This indicator is a measure of the number of new housing units built in a community in the past year. This is a useful metric because it illustrates how the housing market is expanding annually. With implications for accessibility, affordability, and resident mobility, new housing construction is a representation of community health and stability. Quality of Life is also reflected in this measure as it shows that there is increased demand to live in that area.

Examples of Practical Applications:

- Polk County, Florida Quality of Life Indicators
- Healthy Valley, Connecticut Quality of Life Indicators
- Jacksonville, Florida Community Council Quality of Life Progress Report

2. Housing Tenure Types

Housing tenure type is the ratio of the number of people in the community who own their homes to the number that rent. This is a useful indicator because it is indicative of social maintenance.

The safest tenure type is ownership while one of the most precarious tenure statuses is renting.[27] People that own their homes build capital through investing in their property, while those that rent simply pay to occupy a space that they do not own. Ownership allows people to better secure their financial standing, thereby providing greater individual economic freedom and security. These are keys to Quality of Life. So, as the ratio of homeowners to renters increases, one can predict that the Quality of Life in the community would track upwards as well.

Examples of Practical Applications:

- Istanbul Quality of Life Indicators Project
- Jacksonville, Florida Community Council Quality of Life Progress Report

3. Floor Area per Person

Floor area per person is a measure of the ratio of total living space within a district to the number of inhabitants within that district. It has been well documented that an increase in living space per person is highly correlated with an increase in Quality of Life.[28] Appropriate measures of this indicator are highly dependent on the density of the area in question. For example, in high-density cities, floor area per capita is usually lower than in low-density cities or towns. While density is, in part, affected by housing regulations, the correlation between floor area per person and quality of life may be more problematic in high-density areas. Regardless of the level of impact, Quality of Life is intricately tied to increased floor space per person.[29]

Examples of Practical Applications:

- WHO, 1997. Healthy Cities Indicators: Analysis of Data from Cities Across Europe.
- OECD, 1997. Better Understanding Our Cities: The Role of Urban Indicators, EEA Indicator Set.

4. Percent of Income Spent on Housing

Percent of income spent on housing is a measure of the average percent of yearly income devoted to housing costs (rent, mortgage, etc.) This is a useful indicator because Quality of Life is tied to the amount of financial stress that an individual must endure. In that vein, experts agree that people should not be spending more than 1/3rd of their income on housing costs.[30] By devoting too much of ones income to housing, individuals lose discretionary income that could be used for activities that enhance Quality of Life. Individuals who spend a large percentage of their income on housing are likely to experience economic hardship as cost of living continually outpaces income.

Example of Practical Applications:

- St. Michaels, Minnesota Quality of Life Indicators
- The Boston, Massachusetts Indicators Project

SOCIAL ENVIRONMENT

1. Median Age of the Population:

A healthy community will be a composite of young and old residents. However, that age mixture may be concentrated or diffuse within a given area. In addition to the social benefits of an integrated community, this measure also highlights the need for public services required by various age groups. The median age of the population provides a measure of age diversity, and

allows the planning commission to understand the concentration and location of various populations so that services may be provided accordingly.

Examples of Practical Applications:

- Charlotte, North Carolina Quality of Life Study
- Community Indicators Initiative of Spokane County, Washington

2. Average Distance to a Park:

Government services must be accessible to all residents of an area. In that vein, parks are not only one of these services, but they are also an important component of any well-rounded community. They provide a number of social and environmental benefits to both the individual and the community as a whole. For example, parks are often centers for community activity, engagement and relaxation. The average distance a resident of the community is from a park provides a measure of park provision, distribution, and accessibility for Montgomery County residents.

Examples of Practical Applications:

- Indianapolis, Indiana Indicators

3. Yearly Attendance at Montgomery County Public Parks :

Yearly Attendance at Montgomery County Public Parks complements the average distance to the park indicator. In contrast to measures of accessibility, this indicator measures frequency of use. Public parks provide a number of social benefits that increase life quality for community residents. However, a lack of participation could indicate a poorly placed or inefficiently managed park system.

Examples of Practical Applications:

- Community Indicators Initiative of Spokane County, Washington

4. Share of Population Attending Sporting, Cultural, Artistic Events:

This indicator measures the portion of a community that enriches their life experiences through a variety of leisure activities. A measure of attendance at sporting, cultural, and artistic events is indicative of community and individual experience. This measure identifies the individual participation and the extent to which the community as a whole values sporting, art, and cultural institutions on a year-to-year basis. Collecting data on this indicator can be particularly challenging. In the past, localities have either relied on survey data or identified a subset of larger events from which to collect attendance data.

Examples of Practical Applications:

- Community Indicators Initiative of Spokane County, Washington

CIVIC ENGAGEMENT

1. Percent of Eligible Residents Registered to Vote:

This indicator is defined as the proportion of residents over the age of 18 who are registered to vote in general, state, and local elections. Voting—essential to the principles of democracy—is a tool by which the electorate can exercise their voice in the creation of the laws that have

individual, community, and national level impacts. A measure of voter registration is one reflection of the extent to which eligible residents feel the responsibility to participate in civic life. Quality of life is enhanced as each individual voice unites, empowers, and strengthens the bonds within a community.

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project
- Community Indicators Initiative of Spokane County, Washington
- 2006 Osceola County, Florida Report Card

2. Percent of Population with Public Library Membership:

This indicator is defined as the percent of residents who are members of a public library. It is important to note that the frequency of use is not taken into account. Some prior assessments of civic health have chosen to use books in circulation as opposed to membership to reflect public library use. Either form of this indicator is appropriate.

Public libraries are a valuable source of low-cost education and entertainment. In addition to educational resources, public libraries encourage literacy and provide access to computers and internet technology for low-income individuals. Through the organization of book clubs and after school activities, public libraries are often centers for community activity. A study by the Information Use Management and Policy Institute found that libraries contribute to the financial well-being of a community, help support the local businesses and public services, and provide access to job and career resources for local residents.[31]

Examples of Practical Applications:

- Community Indicators Initiative of Spokane County, Washington
- Dallas, Texas Indicators

3. Number of Hours Volunteered on an Annual Basis:

While volunteerism is particularly difficult to measure, it is undoubtedly a primary indicator of civic engagement. The most commonly used means of measuring volunteerism is a count of the actual number of hours volunteered in a specific subset of volunteer oriented organization. Some areas have solicited information from the largest or most well-known organizations while others have focused solely on government run volunteer agencies. It is recommended that the method for data collection be constructed to suit the availability of information in the particular area of interest.

Volunteer activity reflects a concern for community wellbeing at the most basic level. The choice to volunteer, through the commitment of time and energy, is an indication of membership in one's community. Civic engagement is strengthened as more individuals actively choose to play a role in the betterment of their community. In addition, volunteerism plays a significant role in the healthy development of the individual. An *Annual Review of Sociology* article found that volunteering increases life-satisfaction, self-esteem, self-rated health, educational and occupational achievement, and functional ability.[32]

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project
- 2006 Osceola County, Florida Report Card

4. Generosity Index:

The Generosity Index was constructed by the *Catalogue for Philanthropy* and is calculated using data from income tax returns. It is calculated by ranking each states average Adjusted Gross Income (AGI) and the percentage of AGI itemized for charitable giving. The state ranking of charitable giving is then subtracted from the ranking for AGI. The resulting number is used to create the Generosity Index. An *Urban Institute* study recently found that only a small percentage of charities' gross receipts come from individual donations and this should be taken into account when analyzing generosity data. It is recommended that the Generosity Index only be used as a temporary indicator of charitable giving, and it should be replaced as more definitive measures emerge.

The Generosity Index is essentially a quantitative representation of money spent by residents in support of charitable organizations. The implications of this indicator are similar to measures of volunteerism. This indicator measures the percent of their income that residents are willing to commit to community betterment.

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project
- Dallas, Texas Indicators

5. Social Capital:

The Social Capital Initiative of the World Bank defines social capital as, "institutions, relationships, attitudes, and values that govern interactions among people and contribute to economic and social development."[33] Essentially, this indicator measures the level of trust within a community and the extent to which residents are willing to help one-another. While it is extremely difficult to quantify, it is essential for measures of social engagement. Many localities have relied on surveys as a means to assess Social Capital, but the expense of a survey often significantly constrains the collection of useful information. Some localities have combined measures of volunteer activity and monetary giving to reflect Social Capital. As can be seen, both of these have been included as indicators within this dimension. Ultimately, a survey remains the most direct way to measure trust within a community and, if practical, is the recommended method.

Examples of Practical Applications:

- The Boston, Massachusetts Indicators Project
- 2006 Osceola County, Florida Report Card
- Dallas, Texas Indicators

MOBILITY

1. Average Commute Time:

Average Commute Time is an important measure of the performance of a transportation network. A long average commute indicates that a community's transportation services are overtaxed and

poorly designed. Evidence has shown that Quality of Life decreases as residents are forced to pay the opportunity costs associated with long commuting times. Additionally, commuting time impacts living location decisions and, through that, land value. A stressed transportation network has important implications for community stability and health.

Examples of Practical Applications:

- Washington State Indicators
- Community Indicators Initiative of Spokane County, Washington

2. Number of Residents within a 10 Minute Walk of Public Transport:

Mass-transit provides residents with non-vehicular mobility options. A well-used mass transit system not only relieves individuals from stressful roadway travel, but also creates social benefits for the community as a whole. Social benefits come in the form of decreased roadway congestion and pollution. A functioning public transportation network will have accessible public transportation stops. The Number of Residents within a 10-minute Walk of Public Transport measures the availability of public transportation and the viability of the transportation network.

Examples of Practical Applications:

- Boston, Massachusetts Foundation Indicators

3. Pedestrian Friendliness Index:

Along with access to public transportation, a viable transportation network needs to be accessible to pedestrian traffic. Walking is the bet way to save money, limit pollution, and free up traffic. The Pedestrian Friendliness Index uses a variety of data sets (the percentage of streets within 1,000 feet of urban villages, schools and social services that have sidewalks, the number of striped bike lanes, and the number of pedestrian/vehicle injuries and fatalities) to determine community walkability. The higher the index, the more accessible stores, schools, park, and other community activities are to pedestrians.

Examples of Practical Applications:

- Charlotte, North Carolina Quality of Life Study

4. Share of Population Using Public Transportation:

Complementing Number of Residents within a 10 Minute Walk of Public Transport, this indicator further measures the viability of the transportation network. A healthy transportation network will give residents a number of transportation options. The more people that ride public transportation, the more viable the network is as a whole.

Examples of Practical Application:

- San Francisco, California Indicators
- Montgomery County, Maryland Indicators

5. Average Annual Amount of Auto Traveler Delay per Person:

This indicator is meant to be used in conjunction with Average Commute Time. As Spokane County says, “Traffic congestion has an adverse impact on individuals, the local economy, and

the overall community. For the individual, congestion is associated with automobile accidents, stress, decreased fitness, and higher transportation costs. For the local economy, which values speed, reliability, and efficiency, effective transportation is a critical link in the production process for many businesses. For the community, congestion affects air quality, road maintenance, traffic control, and smart growth."

Examples of Practical Applications:

- Community Indicators Initiative of Spokane County, Washington
- Boston, Massachusetts Indicators Project
- Dallas, Texas Indicators

EDUCATION

1. Parental Involvement in Schools:

Students with parents who are involved in their school tend to have fewer behavioral problems and better academic performance. Additionally, these students are more likely to complete their secondary education than are students whose parents are not involved in their school. Parental involvement allows parents to monitor school and classroom activities and to coordinate their efforts with teachers. Teachers of students with highly involved parents tend to give greater attention to those students, and they tend to identify problems that might inhibit student learning at earlier stages.[34] Taking these factors into consideration, it is safe to say that greater parental involvement equates to a better education for a child. Tools to measure parental involvement vary widely across localities and one possible method is to log parent attendance at school events or participation in the local Parent Teacher Association. The appropriate means is largely dependent on available data.

Examples of Practical Applications:

- State of Indiana – Department of Education
- The Boston, Massachusetts Indicators Project

2. High School Drop Out Rate:

Young people who drop out of high school are unlikely to have the minimum skills and credentials necessary to function in today's increasingly complex and technological workplace. The completion of high school is required for accessing post-secondary education and is a minimum requirement for most jobs. Therefore, high school dropouts are more likely to be unemployed than those with a diploma. Employability directly impacts earning potential and job opportunity. Studies have found that young adults with low education and skill levels are more likely to live in poverty and to receive government assistance.[35] With less opportunity for jobs and job growth, high school dropouts are also more likely to stay on public assistance longer than those with at least a high school degree.

Examples of Practical Applications:

- US Department of Education, National Center for Education Statistics
- State of Wisconsin Indicators
- City of Albuquerque, New Mexico Indicators
- Montgomery County, Maryland Indicators

3. Pre-Primary Education Enrollment:

Pre-Primary Education Enrollment is a measure of the share of eligible children enrolled in pre-school programs. Research on brain development reveals that learning experiences introduced to children at an early age are directly linked to successful learning as children mature. Furthermore, children who enter kindergarten ready to learn are more likely to achieve at a high level than are those children who are inadequately prepared. High-quality early childhood programs are particularly important for those children whose families have limited educational experience or for those students with disabilities. Participation in center-based early childhood care and education programs, such as Head Start, nursery school, and pre-kindergarten, helps to prepare children for elementary school and, additionally, serves as childcare for working parents. Pre-primary education is not mandatory, and therefore indicates a community's interest in their children's educational well being. By taking steps to ensure that kids are prepared for elementary school, parents are increasing the effectiveness of primary education.

Examples of Practical Applications:

- US Department of Education
- The Boston, Massachusetts Indicators Project
- State of Minnesota Indicators

4. Test Scores (Student Achievement):

Although standardized test scores are not a perfect indicator for student achievement, they do prove quite useful as a comparison tool due to their uniformity. In addition, they have the ability to give a general sense of student improvement (as tests are given annually), teacher quality, and areas of deficiency (reading, science, math, etc.). States offer their own set of standardized tests, but all US students are also required to take the National Assessment of Educational Progress Exams. Together these two tests will allow Montgomery County to compare its students' performance to that of students across Maryland and the rest of the United States.

Examples of Practical Applications:

- US Department of Education
- State of Maryland

Appendix B: Examples of Practical Applications

Communities

- 2006 Osceola County Report Card: www.communityvision.org/Documents/2006RepCard.pdf
- Anchorage, Alaska: justice.uaa.alaska.edu/indicators/index.html
- Baltimore Neighborhood Indicators Alliance: www.ubalt.edu/bnia/pdf/7._NASC_VS_4.pdf
- Bloomington, Indiana: www.bloomington.in.gov/beqi/index.htm
- Charlotte Quality of Life Study: www.charmeck.org/qol/pdf/2006QualityOfLife_FullReport.pdf
- City of Albuquerque, New Mexico www.cabq.gov/progress/pdf/high-school.pdf
- Dallas Indicators: www.dallasindicators.org/
- Healthy Valley, Connecticut Quality of Life Indicators: valleycouncil.org/Healthy/survey.html
- Hennepin County: wwwa.co.hennepin.mn.us/files/HCInternet/Static%20Files/1128261372004HennepinCountyCommunityIndicatorsReportUpdated.pdf
- Indianapolis: www6.indygov.org/dmdplan/indianapolisinsight/pdfdocuments/land_use_handbook.pdf
- Istanbul Quality of Life Indicators Project: www.istanbul5.org/guidelines/indicators
- Jacksonville Community Council Quality of Life Progress Report: www.jcci.org/statistics/documents/2006_quality_of_life_progress_report.pdf
- Lawrence, KS: www.lawrenceks.org/web_based_agendas/02-27-07/02-2707h/cm_report_fourth_quarter_report2006.html
- Montgomery County, Maryland: www.mcps.k12.md.us/departments/sharedaccountability/reports/2000/MSPP2000.pdf
- Montgomery County, Maryland: www.montgomerycountymd.gov/deptmpl.asp?url=/content/dep/assessment/home.asp
- Newport Beach, California: www.city.newport-each.ca.us/PLN/General_Plan/13_Ch12_Noise_web.pdf
- NW Borough of Alaska: justice.uaa.alaska.edu/forum/13/3fall1996/a_nwarct.html
- Palo Alto: www.city.palo-alto.ca.us/auditor/reports/SEAAudit2004.pdf
- Polk County, Florida Quality of Life Indicators: www.lakeland.usf.edu/Docs/Quality_of_Life_in_Polk_County.pdf
- San Francisco: www.sfgov.org/site/controller_page.asp?id=30343
- Saskatchewan Quality of Life Measures: www.usask.ca/cuisr/docs/pub_doc/quality/OlfertFINAL.pdf
- Spokane County: www.communityindicators.ewu.edu/index.cfm
- St. Michaels, Minnesota Quality of Life Indicators: www.ci.st-michael.mn.us/index.asp?Type=B_BASIC&SEC=%7B83E40BCF-591B-4E85-A4E6-1933A1FF2999%7D
- St. Paul, MN: www.stpaul.gov/mayor/07budget/adopted_documents/2007%20ADOPTED%20BOOK%20Book.pdf

- Sunnyvale, California: www.sunnyvale.ca.gov/reports/1996-12/96-478.htm
- The Boston Indicators Project: www.tbf.org/indicatorsProject/
- The Fargo-Moorehead Community Quality of Life Project: www.fmchamber.com/community/qualityoflife.html
- The Metropolitan Philadelphia Indicators Project: www.metrophilaindicators.org/Pages/home.php

States

- Georgia Community Indicators Program: www.dca.state.ga.us/commind/Datasources1.asp?state=1
- Indiana – Department of Education: http://www.doe.state.in.us/exceptional/speced/isa/new_page_15.html
- Maine Development Foundation: www.mdf.org/
- Maryland: www.marylandpublicschools.org/MSDE/testing/
- Minnesota: education.state.mn.us/mdeprod/groups/EarlyLearning/documents/Publication/009530.pdf
- Washington State: www.ofm.wa.gov/fiscal/pog/indicators/06.asp
- Wisconsin: dpi.state.wi.us/sped/spp-dropout.html

Federal

- Environmental Protection Agency: www.epa.gov/owow/tmdl/
- US Department of Education: www.ed.gov/pubs/AnnualPlan/obj2-1.html
- US Department of Education: nces.ed.gov/nationsreportcard/
- US Department of Education, National Center for Education Statistics: nces.ed.gov/programs/coe/2004/section3/indicator16.asp

Appendix C: Master Plan Analysis

Sorting Montgomery County Master Plan Policy Recommendations into QoL dimensions required value judgments about what each recommendation affects. As is common with public policy, almost all policy decisions affect more than one area of community life. Certain recommendations were cross-listed because they affect more than one QoL dimensions. For instance, a recommendation for a mixed-use zone affects the economy dimension and the social environment dimensions. Another example is a bikeway, which affects mobility and the social environment.

Shady Grove Study Area Master Plan Analysis

		Pub. Safety	Economy	Health	Natural Environment	Housing	Social Environment	Civic Engagement	Mobility	Education
Table 1; policy recommendations	Defer comprehensive rezoning of properties by Sectional Map Amendment until there is evidence of a public/private commitment to implementation of transit								1	
	Allow better implementation of the mixed-use neighborhood concept with a new zone		1				1			
	Eliminate the overly detailed staging approach contained in the 1985 Gaithersburg Vicinity Master Plan									
	Provide transfer of development rights option		1				1			
	Reaffirm 1985 Gaithersburg Vicinity Plan recommendations regarding interjurisdictional recommendations									
	Support future modifications to the Shady Grove Life Sciences Development Plan						1			1
Table 2; public facilities projects	Metro Station Library Kiosk: 300 modular structures for rush hour library service						1		1	
	Gaithersburg Elementary School: construct 30 teacher stations to reach core capacity of 740 students									1
	Summit Hall Elementary Additions: construct 30 teacher stations to reach core capacity of 600 students									1
	Stone Mill: construct 34 teacher stations to reach capacity of 740 students									1
	Muddy Branch Stream Valley Park Unit 3: acquire 2 acres to develop stream valley park				1		1			
	Big Pines Local Park: construct recreation shelter, athletic field, multi-use court, play equipment, parking area, benches bicycle racks, drinking fountain and landscaping at existing 11-acre park				1		1			
	Fields Road Local Park: acquisition and development of a 10-acre park with recreation shelter, athletic fields, tennis courts, multi-use court, play equipment, parking area, benches, bicycle rack, drinking fountain and landscaping				1		1			

		Pub. Safety	Economy	Health	Natural Environment	Housing	Social Environment	Civic Engagement	Mobility	Education
	Life Sciences Center -- New Design: design and construct improvements to enhance image of the Life Sciences Center						1			1
	Life Sciences Center: design and construct site improvements to support the JHU Center for Advanced Studies						1			1
Table 3; environmental projects	nothing									
Table 4; Transportation projects	Ritchie Parkway: construct 4 lanes from Glen Mill to MD 28								1	
	Decoverly Drive: construct 4 lanes from Muddy Branch to Fields Road								1	
	Fields Road: widen from 5 to 6 lanes from Sam Eig Highway to Omega Drive								1	
	Gaither Road: construct 4 lanes from Redland to Gude Drive								1	
	Piccard Road: construct 4 lanes from Redland to Gude Drive								1	
	Exclusive transit way connection from Redland Road West to Shady Grove Road								1	
	Great Seneca Highway: widen from 4 to 6 lanes from Muddy Branch Road to Shady Grove Road								1	
	Life Sciences Center Roadway Improvements: intersection improvements within LSC								1	
	Muddy Branch Road: construct 4 lanes of an ultimate 6-lane divided major roadway								1	
	Sam Eig Highway: construct 6 lane divided main roadway from I-270 to Fields Road and 4 lanes from Fields Road to M-90								1	
	Key West Avenue: widen from 4 lanes from MD-28 west to M-90								1	
	Muddy Branch Road: widen from 4 to 6 lanes from MD-28 to I-270								1	
	Shady Grove Road: construct 4 lanes from M-90 to Piney Meetinghouse Road								1	
Table 5; recommendations after master plan adoption	A non-residential zone for the Shady Grove Life Sciences Center		1				1			
	Location of the light rail maintenance and storage yards		1						1	
Table 6; status of other ongoing county/local/state reports	Congestion Relief Study								1	
	I-270 Corridor Cities Transit Easement Study								1	
	Shady Grove - Clarksburg Transit way Study (Phase 2)								1	
	City of Rockville Bicycle Master Plan update (1997)						1		1	
	City of Gaithersburg Parks, Recreation and Open Space Plan for the 21st Century (1998)				1		1			
	City of Gaithersburg Master Plan (1997)									
	City of Rockville Transportation Chapter (1997)								1	

		Pub. Safety	Economy	Health	Natural Environment	Housing	Social Environment	Civic Engagement	Mobility	Education
	City of Rockville Master Plan (1993)									
	City of Gaithersburg Transportation and Sensitive Areas Master Plans (1996)				1				1	
Total		**0**	**4**	**0**	**5**	**0**	**12**	**0**	**28**	**6**
Source: 2002 Montgomery County Master Plan Status Report										

Endnotes

[1] Liu, Ben-Chieh. "Economic and Non-Economic Quality of Life: Empirical Indicators and Policy Implications for Large Standard Metropolitan Areas". *American Journal of Economics and Sociology*. Vol. 36, No. 3. (July, 1977), Page 226.
[2] Maslow, Abraham. Motivation and Personality. Harper and Row: New York. 1970.
[3] Liu, Ben-Chieh. "Economic and Non-Economic Quality of Life: Empirical Indicators and Policy Implications for Large Standard Metropolitan Areas". *American Journal of Economics and Sociology*. Vol. 36, No. 3. (July., 1977), Pages 225-240.
[4] Lane, Robert. E. "Quality of Life and Quality of Persons: A New Role for Government". *Political Theory*. Vol. 22, No. 2. (May, 1994). Pages. 219-252.
[5]Esposto, Alfredo. "Economic Freedom and the Quality of Life: An Empirical Analysis." *Journal of Constitutional Political Economy*. Volume 10, Number 2 (June 1999.) Pages 185-197.
[6] http://www.nber.org/papers/W8587.pdf
[7] http://www.joem.org/pt/re/joem/abstract.00043764-199910000-00007.htm;jsessionid=GhjRxh9lRlsNJvsfZMhQ4lqL7vptGWX41Tl55GcVn6nTShSy1Y2v!-680354521!-949856145!8091!-1
[8] http://www.nber.org/papers/W8587.pdf
[9] http://www.cdc.gov/ncidod/diseases/water/drinking.htm
[10] Roback, Jennifer. "Wages, Rents and the Quality of Life." *The Journal of Political Economy*. Vol 90, No. 6 (Dec, 1982.) Pages 1257-1278
[11] Putnam, Robert. "Bowling Alone: America's Declining Social Capital". *Journal of Democracy*. Vol. 6.1 (1995). Page 67.
[12] *ibid* 65-78.
[13] The Master Planning Process. The Montgomery County Department of Park and Planning. September, 1997. http://mcparkandplanning.org/community/about/mp_process.pdf.)
[14] Individuals or groups with expertise in the areas targeted by the purpose report would be particularly important.
[15] *Unemployment Rate* http://ceroi.net/ind/display.asp?indID=67
[16] *Charlotte Quality of Life Study*. http://ww.charmeck.org/qol/pdf/2006QualityOfLife_FullReport.pdf
[17] *Quality of Life and Poverty: http://indiabudget.nic.in/es2001-02/chapt2002/chap102.pdf*
[18] http://www.jcci.org/statistics/QoLdata.aspx
[19] http://mcr.sagepub.com/cgi/reprint/60/2_suppl/3S.pdf
[20] http://jama.highwire.org/cgi/content/abstract/284/16/2061
[21] Kessner, DM and J. Singer. *Infant Death: An Analysis by Maternal Risk and Health Care*. National Academy of Sciences, Institute of Medicine. 1973.
[22] http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1619097&blobtype=pdf
[23] Data from the National Immunization Survey can be found at the following website: http://www.cdc.gov/nip/default.htm
[24] http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1435674&blobtype=pdf
[25] Bolund, Per and Sven Hunhammer. "Ecosystem Services in Urban Areas". *Ecological Economics.* Vol 29 (1999). Pages 293-301.
[26] http://www.its.bldrdoc.gov/fs-1037/fs-1037c.htm
[27] http://ceroi.net/ind/display.asp?setID=&indID=47
[28] OECD, 1997. Better Understanding Our Cities: The Role of Urban Indicators, EEA Indicator Set.
[29] UNCHS. http://www.urbanobservatory.org/indicators/database/key.html
[30]*Try to Keep Rent Under a Third of your Gross Income, Experts Advise* http://www.washingtonpost.com/wp-dyn/content/article/2006/05/19/AR2006051900643.html?nav=rss_rentals

[31] http://dlis.dos.state.fl.us/bld/finalreport/
[32] http://www.jstor.org/view/03600572/ap010003/01a00110/0
[33] Grootaert, Christian and Thierry Van Bastelaer. Understanding and Measuring Social Capital: A Multidisciplinary Tool for Practitioners. The World Bank: Washington DC. 2002. Page 2.
[34] http://www.childtrendsdatabank.org/indicators/39ParentalInvolvementinSchools.cfm)

[35] Boisjoly, J., Harris, K., and Duncan, G., 1998. "Initial Welfare Spells: Trends, Events, and Duration," *Social Service Review*, 72 (4), 466 - 492; Moore, K., Glei, D., Driscoll, A., Zaslow, M., and Redd, Z. (in press). "Poverty and Welfare Patterns: Implications for Children," *Journal of Social Policy*.