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Editors

Community Quality-of-Life Indicators series 1

Community Quality-of-Life Indicators: Best Cases III



Springer

Community Quality-of-Life Indicators: Best Cases III

Community Quality-of-Life Indicators: Best Cases series

Volume 1

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The Community Quality-of-Life Indicators: Best Cases book series is a collection of books, each containing a set of chapters related to best practices of community quality-of-life indicators projects. Many communities (cities, towns, counties, provinces, cantons, regions, etc.), guided by their local planning community councils and local government, develop community indicator projects. These projects are designed to gauge the “social health” and well-being of targeted communities. These projects typically involve data collection from secondary sources capturing quality-of-life indicators (i.e., objective indicators capturing varied dimensions of economic, social, and environmental well-being of the targeted communities). The same projects also capture community well-being using primary data in the form of survey research. The focus is typically subjective indicators of quality of life such as community residents’ satisfaction with life overall, satisfaction with various life domains (e.g., life domains related to social, leisure, work, community, family, spiritual, financial, etc.), as well as satisfaction with varied community services (government, nonprofit, and business services serving the targeted communities). The book series is intended to provide community planners and researchers involved in community indicator projects with prototypic examples of how to plan and execute community indicator projects in the best possible ways.

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Preface

Community quality-of-life (QOL) indicators continue to gain attention and interest in their use as many communities and regions design and apply them. Evolving from early use as data systems, indicators are increasingly being integrated into overall planning and other public policy activities. Their use is found not only in monitoring and evaluation applications, but also in the context of increasing citizen participation in guiding communities towards achieving desired goals. Indeed, the emphasis in many indicator applications now includes linking actions to outcomes – making sure that the indicators are integrated, useful and effective in helping communities address QOL issues. The use of QOL indicators to consider a full spectrum of community and regional well-being is exciting and the focus on integration is certain to bring new and innovative applications to the forefront.

This is the third book in a series covering best practices in community QOL indicators. Each volume presents individual cases (chapters) of communities at the local or regional levels that have designed and implemented community indicators programs. In Volume I, we present eight chapters from a variety of contexts – from the county level in the U.S., to the large megalopolis of Sao Paulo, to looking at a cross section of communities throughout Europe. Also included are three chapters from Canada, a leader in applying community indicator systems. Each chapter in this volume presents a history or context, followed by a description of how the indicator systems were selected and applied, and then discussion of policy implications and outcomes. What is clear in this volume is the continuing evolution of QOL indicator systems and their applications so that decision making in communities and regions is enhanced.

Chapter 1 presents a detailed case of applying indicators at the county level in the U.S. to serve as a catalyst for change, influencing political and social change. The system is extremely comprehensive and targets specific issues to influence and track subsequent changes. The focus is on linking actions to outcomes, with a results based accountability method integrated with QOL indicators by making changes beginning with shared outcomes and working to develop action plans for achieving the desired changes.

Chapter 2 brings in an international perspective by looking at the Slow City movement in communities throughout Europe. The Slow City charter adopted by 77 cities provides a philosophical basis for a set of action-oriented indicators. By

concentrating efforts to maintain a cultural heritage, QOL is the central focus of this type of indicator system.

Chapter 3 is another case at the county level – but this time, with a crucial overall mission of serving as an early warning environmental system. Clark County, Nevada is faced with having tons of high-level nuclear waste shipped through it and the concerns associated with it are the focus of the community. The system developed continuously serves to monitor the area’s socio-economic, fiscal, environmental, and public health and safety well-being.

Another issue focusing on environmental health is presented in Chapter 4. In the region surrounding Milwaukee, brownfield sites are of major concern. The indicator system has been developed to monitor brownfield redevelopment and urban renewal in such a way to incorporate overall community QOL.

The next two chapters present detailed analysis of statistical/quantitative methodologies. Spatial effects are examined in Chapter 5. Using Sao Paulo as the case, exploratory spatial data analysis is applied to look at the influence of spatial effects and urban indicators. Focusing on intra-urban inequality, the case relies on the UN’s Human Development Index and an Economic Concentration Index devised for the study.

In Chapter 6, taxonomic and mapping techniques are used in a theoretical analysis for the Peel region in Ontario. Using a quantitative analysis of QOL diversity, it identifies indicators of spatial imbalance.

The Federation of Canadian Municipalities’ Quality of Life Reporting System has operated since 1996. Chapter 7 provides an analysis of this system that 22 city and regional governments use, including key findings of evaluative reports. The system plays an important role in city and regional efforts to address sustainable development and QOL issues.

A municipal level indicator system is further explored in Chapter 8, with the case of a neighborhood-based approach to QOL reporting from Calgary. The Indices of Community Well-being provide a way to increase awareness of the value of social data for planning and decision making.

The chapters in this volume illustrate the complex, integrated, and multifaceted issues that QOL indicators represent. It is our desire that this information will spur leaders, citizens and policy makers to explore and apply indicators to strengthen QOL in their communities and regions.

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Chapter 1

Connecting Outcomes to Indicators: The Santa Cruz County California Community Assessment Project (CAP)

Deanna Zachary

Abstract Santa Cruz County California has one of the oldest community indicator projects in the country, with the first year of the Community Assessment Project (CAP) starting in 1994 and continuing through 2006 and beyond. The CAP accomplishes four major goals: (1) to assess the quality of life in the county; (2) to educate community members about the economy, education, health, public safety, natural environment and social environment of the region; (3) to act as a catalyst for social and political change; and (4) to help evaluate the impact of social and political change in the county. This chapter will outline the history of the CAP, how the CAP reveals the quality of life in the county and educates community members, the successes of the CAP in acting as a catalyst for change in the community, challenges for the CAP, and recommendations for how the Santa Cruz County CAP, and other community indicator projects, might increase their ability to make political and social change.

1.1 Introduction

Santa Cruz County, California is now considered a predominantly urban county, but it still has large parcels of agricultural land in the southern parts of the county while there are extensive redwood forests in the northern parts of the county. The county is located next to the Monterey Bay, along the Central Coast of California, 65 miles south of San Francisco. It is now famous for surfing and tourism, but was historically known for fishing and the lumber it supplied to rebuild San Francisco after the great earthquake and fire of 1906. There are 262,312 residents, the majority of whom are Caucasian (64%), followed by an increasing Latino/Hispanic population –30% (State of California, Department of Finance, 2004).

The Santa Cruz-Watsonville area ranked as the second least affordable place to live in the nation, according to the National Association of Home Builders' 2002

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Housing Opportunity Index. The median price of a home was \$625,000 in 2005 (National Association of Home Builders, 2005), due in part to the proximity of Santa Cruz County to Silicon Valley, one of the nation's major technology centers. Only 15% of households were able to afford a median priced home in 2004 (California Association of Realtors, 2005). Latinos face a greater burden in the area of housing costs. In a community assessment telephone survey in 2005, 75% of Latinos surveyed said they spent one half or more of their total household take-home pay for rent and housing costs (Applied Survey Research, 2005, p. 40). The housing costs are high and so too is the median family income at \$75,300 in 2005 (U.S. Department of Housing and Urban Development, 2005). The annual unemployment rate in 2005 was 8.8%, higher than the state of California at 5.4%, and the unemployment rate was even higher in the predominantly Latino city of Watsonville at 14.7% in 2004, partially due to the high numbers of Latino farm workers (State of California, Employment Development Department, 2006; U.S. Department of Labor, 2005). Overall, job growth in the county increased by 4.1% from 1994 to 2004. The greatest job growth was in "natural resources, mining and construction" (92.9%), and "government" (28.2%). The industries with the greatest job losses over the past ten years were "information technology" (down 37.9%) and "manufacturing" (down 29.4%) (State of California, Employment Development Department, 2005).

The Santa Cruz County Community Assessment Project (CAP) was started in 1994 by the United Way of Santa Cruz County when it convened a collaborative of over 25 agencies ranging from public and private health organizations, to education, human services, and civic organizations. Dominican Hospital, one of two hospitals in the county, was an especially critical partner in the project. California state legislation (SB697) had been passed which required non-profit hospitals to demonstrate the benefits they offered to their communities. One common way that hospitals tried to demonstrate their benefit was to conduct a needs assessment in each of their communities. In order to not duplicate community assessment projects in Santa Cruz County, CAP stakeholders agreed to a collaborative community assessment project. The collaborative that formed in 1994 still exists in 2006, with the addition of several new partners totaling approximately 35 partner agencies directly involved in the CAP. The goal of CAP is to continually improve the quality of life for Santa Cruz County residents by: raising public awareness; providing accurate information to guide decision-making about the creation, management and redesign of community programs; setting community goals using measurable quality of life indicators; establishing collaborative action plans to achieve these community goals; and evaluating the impact of social and political change.

For more than a decade, the United Way has continued to have the largest role in the creation and guidance of the CAP. In 1994, financial sponsorship totaled approximately \$60,000–\$65,000. By 2005, financial sponsorship was approximately \$75,000 per year and included 23 sponsors. The top two sponsors in 2005 were the county's Human Resources Agency (at \$30,000) and Dominican Hospital (at \$20,000).

Applied Survey Research (ASR), a non-profit social research and evaluation firm, was contracted by the United Way to be the researcher for the CAP and

to incorporate best practices from other assessment efforts across the nation. The Santa Cruz CAP partners looked to dozens of community assessment projects and incorporated best practices especially from the Jacksonville, Florida model, the Snohomish County Counts in Washington, and an assessment project in Albuquerque, New Mexico. Like Jacksonville, CAP developed a steering committee with members from diverse public and private interests including staff from the United Way, ASR, the local hospital, the county office of education, law enforcement, community-based organizations, the daily newspaper, the housing authority, several county agency divisions, the community college and several volunteers. As of 2005, there were 37 members of the CAP steering committee. The CAP initially modeled their face-to-face survey methodology of community residents from the Snohomish County Counts project but after several years, due to the high cost, CAP replaced face-to-face surveys with a random digit telephone survey. The CAP looked to Jacksonville and Albuquerque, New Mexico's community assessments to model their Technical Advisory Committees (TACs) where experts from different fields come together to discuss indicator selection and to refine indicators. The TACs used special criteria to develop the quality of life indicators used for this project. These criteria stipulated that indicators needed to be understandable to the general user and the public, respond quickly and noticeably to change, be relevant for policy decisions and available annually. In 1994, CAP created special Technical Advisory Committees in particular subject areas, including children's issues, elder issues and Latino affairs. CAP still uses the Technical Advisory Teams but CAP has always sought input on indicators from a wide range of citizens and "non-experts" in community indicator selection. In 1994, over 550 individuals gave input into the indicator selection process. In 1994, stakeholders agreed to 77 indicators in five areas: the economy, education, health, public safety, and the social environment. After several years, CAP stakeholders added a sixth area for the natural environment. By 2005, the number of indicators had increased to 125 indicators, in all six areas. There is an expectation that the number of indicators will increase to 135 in 2006.

When the CAP was created in 1994, it was clear that Santa Cruz County would experience enormous changes over a ten-year period, especially due to the boom in the technology fields in nearby Silicon Valley. As home prices soared in Silicon Valley, Santa Cruz County became a good choice for those high-tech workers who wanted to live in a less expensive, more scenic area. In response to those changes, the CAP philosophy was that an organized, collaborative, community-wide approach could positively affect important aspects of community life so that growth and change would not be left to chance.

1.2 The CAP System

The CAP is based on primary data and credible secondary data that are gathered for 125 indicators in six areas: Economy, Education, Health, Public Safety, the Natural Environment, and the Social Environment. Economic indicators include

such things as retail sales, agricultural production, tourism, unemployment rates, job growth, income levels, poverty levels, and housing affordability. Education indicators include enrollment, expenditures, special education, standardized testing scores, English proficiency, drop out rates, child care, college and university attendance, library use, job training and adult education. Health indicators include access to health care, insurance coverage, births, prenatal care, substance use, mental health, disability status, obesity, and leading causes of death. Public Safety indicators include crime rates, police per capita, child abuse, elder abuse, disaster preparedness, family violence, and jail population characteristics. The indicators for the social environment include voting, racism, discrimination, hate crimes, homelessness, food bank usage, quality of life, volunteerism, youth activities and charitable giving. Indicators for the natural environment include open space, acreage, miles of recreation trails, park use, farmland, pesticide use, water quality, beach closures, water use, air quality, roadway congestion, transportation, and endangered species.

Out of the overall indicators, some indicators are chosen as key indicators. The key indicators are not necessarily the most important quality of life indicators, but the most indicative of the overall condition of that particular subject area. If key indicators are improving or worsening, it is likely that trends on the whole are moving in the same direction. Some key indicators in 2005 included: job growth, household income, housing affordability, educational test scores, child care enrollment, access to health care, crime rate, family violence, voting, racism and discrimination, hate crimes, youth activities, open space acreage, coastal wetlands, and water use.

1.2.1 Goals and Purposes

The CAP includes a list of community goals for improvement. There are several goals for each of the six topical areas of Economy, Education, Health, Public Safety, the Natural Environment, and the Social Environment. Progress toward these goals has been tracked each year through measurable quality of life indicators. In 1994, community goals were selected by a broad cross section of Santa Cruz County residents to guide decision making, planning and social action for the next ten years until 2004. The goals were broad in nature. Some of the goals for the economy included: unemployment rates lower than the state and more residents having access to housing they can afford. Some education goals include: higher graduation rates, all children will enter school ready to learn, and special needs children will have access to a full range of services. For health, one of the top goals in 1994 was for all residents to have access to health care. In 2006, new goals are being chosen to guide the next four years of the CAP until 2010. In order to facilitate the creation of new goals in 2006, non-profit organizations and businesses have become sponsors in each of the goal areas and teams are meeting to choose the 2010 goals and to discuss necessary strategies to attain those overall goals. The CAP stakeholders redesigned the goal process with sponsors and action strategies in mind, so that the CAP will contribute to more community wide social and political change.

To recognize positive change, the CAP has annually honored community heroes, individuals whose efforts helped move Santa Cruz County toward the achievement

of the community goals. A local paper, the *Santa Cruz Sentinel*, sponsors the selection of annual Community Heroes, and readers can submit their recommendations for community heroes. Heroes are selected in each of the CAP goal areas and are honored at the yearly CAP press conference in November. Two local newspapers provide coverage of the community heroes, and heroes are also profiled on local talk radio. The press conference and community hero celebration is also recorded by the Public Access Community Television station and broadcast throughout the year.

1.2.2 Data Sources for the CAP

Data sources for the CAP are divided into primary data from a telephone survey, now conducted every other year, and secondary data from a variety of local, county, state and federal sources.

1.2.2.1 Primary Data

The central primary data come from a telephone survey of a sample of Santa Cruz County residents, in both English and Spanish with over 700 randomly selected county residents. The intent of the survey is to measure the opinions, attitudes, desires, and needs of a demographically representative sample of the county's residents. Respondents are asked open-ended questions as well as questions that present confined options. Historically, the telephone survey was conducted every year, was not conducted in 2004, but resumed again in 2005 and will be conducted biennially thereafter. Each year, new questions are added to the telephone survey as residents and stakeholders recognize that there are gaps in their knowledge about the community. For example, questions have been added about homelessness, disabilities, access to health care for children, stewardship for the natural environment, and the percentage of people who spend more than 75% of their take home pay on housing costs.

In 2005, telephone contacts were attempted with a random sample of residents 18 years or older in Santa Cruz County. Potential respondents were selected based on phone number prefixes, and quota sampling was employed to obtain the desired geographic distribution of respondents across the three regions in the county. Surveys were completed with 710 respondents in the county, and each completed survey took an average of 18.5 minutes.

1.2.2.2 Secondary Data

Secondary data are collected from a variety of sources, including but not limited to: the U.S. Census; federal, state, and local government agencies; academic institutions; economic development groups; health care institutions; libraries; schools; local police, sheriff and fire departments; and computerized sources through online databases and the Internet. CAP staff has developed extensive relationships with staff of national, state and local agencies in order to get additional data runs from these agencies and more specific data on subpopulations. Subpopulations include

individuals who live in different regions of the county, as well breakdowns by race, gender, ethnicity, income level, and age. There are also cross-tabulations for data such as teen births by age and location of the birth in a particular hospital or the projected number of adults with diabetes by gender, age and ethnicity.

1.2.3 Publication of the CAP

Each year, the CAP is published in several forms including a large compendium of the 125 indicators with data for the last decade for each indicator, where available. This larger document consists of approximately 330 pages and is available for purchase for \$25, and is given to several elected officials, including members of the county board of supervisors, the two Congressional representatives for the district, the state assembly member, the state senator and several city council members for the four cities. This longer CAP document is also available on the website of the research partner, ASR and the United Way. A shorter executive summary is prepared by the local hospital and is sent to every resident in the county as part of the hospital's larger newsletter.

1.2.4 CAP Stakeholder Survey

The CAP Steering Committee decided to perform an evaluation of the CAP in 2003. The CAP Stakeholder survey had 46 respondents from a variety of fields, including non-profit organizations, Human Services, county/city government, law enforcement, business, health services, and the arts/culture/humanities. Individuals were chosen to participate in the study based on their experience with the CAP including CAP funders, people who had used the CAP, leaders of organizations that had exposure to the CAP, and some individuals who one would have expected would have used the CAP but had not. Over 57% of respondents were *very satisfied* with the CAP and 33% were *somewhat satisfied*. The largest percentage of respondents (34%) used the CAP every 2–6 months, 28% used it monthly, 18% used it every 7–12 months, 16% used it rarely, 5% used it weekly, and 5% never used it. When asked how often the CAP should be published, the largest percentage said every two years (46%) as compared to every year (39%). Almost 70% of respondents said that others in their organizations also used the CAP data. When asked an open-ended question about the use of the CAP, the top answer was for *grant writing*.

1.3 Comparisons to Other Community Assessment Projects

As previously mentioned, the Santa Cruz CAP drew lessons from other indicator projects across the country. CAP modeled its steering committee from the Jacksonville Florida project, the face-to-face survey methodology from Snohomish

County, and the Technical Advisory Committees from Jacksonville and Albuquerque New Mexico's assessment. However, CAP had some different goals and intentions from other community indicator projects and in some cases, a faster timeline between data findings, community action, and results. Many community indicator projects are designed to be neutral data documents that other organizations may use to facilitate community change. CAP data are also neutral, in that data are from credible primary and secondary sources, but CAP was designed to be more explicitly linked to community change efforts. The United Way was the founder and guiding organization behind the CAP and the United Way used CAP data to develop priorities for community change efforts and to facilitate organizations to collaborate for those changes. A comparison of community indicator projects also highlights how long it takes for communities to make change, whether or not it was the specific intention of the community indicator project.

The Jacksonville, Florida project was designed to be a neutral data resource and the action piece was expected to come from other organizations. The data documents, however, contained indicators that showed negative findings and pointed to areas that needed change in the community. Out of the annual data reports was born a mechanism for deeper data analysis, known as Community Improvement Studies. For example, the indicator report showed high levels of teen pregnancy so the umbrella organization for the project, the Jacksonville Community Council Inc. (JCCI), called for a deeper Community Improvement Study on the topic of teen pregnancy in 1982 (JCCI, 2005, p. 2). The JCCI has called for and conducted approximately 70 Community Improvement Studies, together with two-year implementation plans to impact change for the indicators. In the case of teen pregnancy, JCCI facilitated a group of citizens to meet in 1984 to discuss teen pregnancy and develop action steps to impact the high levels of teen births. By 1994, after more than a decade, the local indicators revealed a slight decrease (approximately 4%) in the rate of teen births in Jacksonville. A second study of teen pregnancy was conducted in 1995, and a new larger collaborative was formed which was able to ultimately leverage \$4 million in funding, including several large grants from the Centers for Disease Control (CDC). Soon thereafter, Jacksonville witnessed a large decline in teen pregnancy rates, larger than the national average. From 1995 to 2004, the birth rate for teens ages 15–17 was cut by 43% (JCCI, 2005, p. 2). The data had acted as a catalyst for change. The JCCI in Florida facilitated a collaborative partnership of agencies to implement new strategies to impact the indicator. The Florida project contributed to changing trend lines in several areas through its Community Improvement Studies and implementation plans designed in association with the Community Improvement Studies.

The Jacksonville project contributed to community change in the area of teen pregnancy and several other areas but change took a considerable period of time. It takes considerable time to select and refine indicators, track data, facilitate a collaborative of agencies and non-profit organizations to develop outcomes and action strategies, as well as implementing the strategies. Finally, it takes several years to identify a trend line in a positive or less negative direction.

When the Jacksonville, Florida community indicators project was examined in a 1999 research paper, after 14 years of the project, there were significant and extensive outcomes for the project, but few of them could be tied to changing specific indicators. The report was written by researchers from an organization called Redefining Progress in Oakland, California and was entitled, "A Community Indicators Case Study: Addressing the Quality of Life in Two Communities." The report focused on two of the most successful indicator projects at the time including Jacksonville, Florida and Truckee Meadows in Nevada. The findings showed that Jacksonville was extremely successful in creating a community indicator process, in developing widespread community commitment to the project, a diverse group of stakeholders, a rich data publication, widespread distribution of the report, widespread outreach and use by the media, new research agendas for the community, and a group of citizens, including political leaders, the city of Jacksonville, the United Way, and the Chamber of Commerce that used the data to guide decision making. But the report in 1999 did not outline any individual indicators that had been changed as a result of social or political action.

The report said that indicators were used by the Chamber of Commerce to establish a program to improve water quality in the St. Johns River, including an annual river clean up day, but there were no scientifically measurable results to substantiate improved water quality. The Jacksonville stakeholders chose education as one of the most important areas for change during the 1990's, specifically the public high school graduate rate. The assessment project led to a community study on ways to improve education, including 155 detailed recommendations, and work began on the project, but according to the researchers, "tangible outcomes will not become evident for years" (Besleme, Maser, & Silverstein, 1999, p. 21). As previously mentioned, stakeholders also focused on teen pregnancy and this was one of the most successful parts of the project cited by the researchers in 1999. However, the researchers did not see any changes in indicators for teen pregnancy by 1999, or in any other indicators.

The Redefining Progress researchers' analysis in 1999 of the Truckee Meadows project, a project based on the Jacksonville model, is especially instructive for how long it can take to select and finalize the indicators and to create the first community report card. The Truckee Meadows Tomorrow (TMT) project started in 1992 in order to evaluate the impact of growth in the region, and whether there was too much growth (Besleme et al., 1999, p. 25). One of the goals of the project was to integrate indicators into the government's regional planning, but according to the researchers in 1999, "the government has been slow to actually adopt them in some aspects of the planning process." The researchers pointed out that although the project began in 1992, indicators were not selected and finalized until 1994, after more than 3,000 people had participated in the process. According to the report, "It took almost a year to select the indicators and another nine months to get the indicators adopted into the Regional Plan" (Besleme et al., 1999, p. 34). The indicators were adopted into the Regional Plan in 1994, and became a part of the planning and reporting process. In 1997 and 1998, the group produced the first community report card based on the indicators.

Some initial outcomes of the TMT project by 1999 included: more stringent policies in the Regional Plan; the Planning Commission must prepare detailed memos on development proposals, notating the impacts on quality of life indicators; corporations and non-profit organizations adopted indicators to improve the quality of life in the region; and grants are allocated to organizations based on criteria to impact indicators. This list of outcomes for Truckee Meadows was compiled by the researchers in their 1999 report, and indicates that it takes a long time for community indicator projects to be created and implemented before they are successful in moving from data to initial action; it takes even longer before indicators show improvements.

The Santa Cruz CAP moved quickly within one year from its initial creation to selection and finalization of indicators and a community report card, but many community assessment projects take a long time to move from planning to implementation to social and political change. Each of the three projects spent their early years in building community networks, raising awareness of indicators and the quality of life in their respective regions, creating linkages with community partners and the media, developing new research agendas, and gaining community support. Jacksonville, Florida had success turning the curve on teen pregnancy, but it took over 15 years. Santa Cruz County had success in turning the curve on teen alcohol and drug use more quickly with extensive facilitation by the United Way and a collaborative of over 110 organizations focusing on the problem. CAP data from the 1995 report showed high levels of teen substance use, and a collaborative was formed that same year to determine and implement interventions. The trend line on teen substance abuse continued to increase until the next year, 1996, after which it began to slowly decrease, year by year.

Santa Cruz County CAP moved quickly from data to action on teen substance abuse with the help of the United Way but the CAP may be able to achieve even greater success through some of the strategies implemented by Jacksonville and Truckee Meadows, two of the oldest and most successful indicator projects.

1.4 Lessons Learned from Other Indicator Projects

Santa Cruz County CAP may want to consider borrowing additional strategies from Jacksonville and Truckee Meadows including: limiting the number of indicators, increasing public education through more data presentations, expanding the pool of participants in indicator selection to develop more widespread support for the CAP, expanding funding from state and federal sources, and encouraging the county and non-profit organizations to fund their grantees if grantees use that funding to impact specific indicators.

1.4.1 Number of Indicators

The Santa Cruz CAP project has many more indicators than Truckee Meadows and slightly more indicators than Jacksonville. In 1994, CAP had approximately 77

indicators and by 2005, that number increased to 125 indicators with some expectation that the number would increase to 135 indicators in 2006. The Santa Cruz experience has been to generally add indicators every year, whereas the Truckee Meadows experience has been just the opposite. In 1993, Truckee Meadows had 66 indicators but in 1998, they worked with the United Way to develop a “community consensus” around priority indicators and to decrease the 66 indicators to 30 indicators that they still maintained in 2005 (Hruby & Maser, 2005, p. 4). Jacksonville had approximately 74 indicators in 1999 and by 2005 that number increased to 114 indicators. There are benefits and challenges to having more indicators. On the positive side, the CAP acts as a rich data resource for many different businesses, organizations and individuals. On the other hand, a surplus of indicators can act as a barrier to collective community action. Many successful community indicator projects have fewer indicators allowing them to focus action plans on just a few indicators. Truckee Meadows is now well known as a community that was able to focus their community change efforts and achieve community change. Jacksonville has a larger number of overall indicators than Truckee Meadows, but their intensive Community Improvement Studies allow their community to focus on one topic area, like teen pregnancy, and to develop two year implementation plans for that issue area.

1.4.2 Adopt an Indicator

One of the great recent successes of the Truckee Meadows Tomorrow Project is their Adopt-an-Indicator program for individuals, businesses and organizations. Groups and individuals choose an indicator to change and those that are most successful are recognized and celebrated at a yearly event with over 1,000 people in attendance. The Santa Cruz CAP has a community heroes event that shares some similarities in that heroes are nominated by readers of the local newspaper to receive an award for their work toward a CAP goal, in each of the six goal areas. But CAP heroes are chosen after making contributions to the community, whereas the Adopt-an-Indicator project allows groups to choose an indicator up front and work towards achieving a change. The CAP is, however, undergoing a change in 2006 whereby businesses and non-profit organizations are sponsoring specific goal areas and developing action strategies to attain those goals. In other words, the CAP is focusing on moving from data to action and the action will be focused on strategies to attaining goals, rather than on the indicators. The new CAP agenda might be described as “Adopt an Action Strategy” rather than “Adopt an Indicator.”

1.4.3 Data Presentations

Jacksonville has a speakers’ bureau that, according to the 1999 study of the Jacksonville project, gave approximately 150 presentations each year about the

community data to local groups (Besleme et al., 1999). According to JCCI staff in 2006, JCCI speakers conduct far fewer data presentations for the community now, but other non-profit organizations and agencies conduct their own data presentations to the community. In this sense, Jacksonville indicator project staff trained other trainers to present data about the community assessment project. The Santa Cruz CAP has in the past provided some data presentations to the community, especially to grantees of the United Way of Santa Cruz County, but it never achieved Jacksonville's level of communicating data to the public through presentations.

1.4.4 Indicator Selection

The Santa Cruz CAP has teams of experts with knowledge of each of the six CAP areas to help choose and refine indicators in each area. When the CAP first began, there were over 550 individuals who helped provide feedback on indicators. However, Truckee Meadows involved over 3,000 individuals in their indicator selection process. While that amount of community involvement was very time consuming and delayed the selection and finalization of the indicators, it also provided a forum to develop widespread community support and knowledge about the project and the indicators.

1.4.5 Funding for the Assessment Projects

Santa Cruz County has operated on a small budget from 1994 to 2005, with funding ranging from approximately \$60,000 in 1994 to \$75,000 in 2005. As of 2005, the Jacksonville indicator project was funded at \$125,000 for the report itself, and each year, \$100,000 is given to the Community Improvement Studies and the two-year implementation plans. Truckee Meadows has been especially successful with one of their funding streams from the Washoe Medical Center, which provides funding for operations, administration and publicity as well as a fund to provide grants to the community. The grants are given to collaborative projects that aim to improve the status of a quality of life indicator. In other words, grantee funding is based on whether the grantee intends to impact a specific indicator. In 1996, the Washoe Medical Center gave a \$500,000 grant to Truckee Meadows to make grants to collaborative projects and \$250,000 for administration (Besleme et al., 1999, p. 30). The United Way of Santa Cruz County also requires grantees to show how their programs contribute to a CAP indicator or a CAP goal. It might be helpful if other non-profit organizations, foundations and county agencies also tie their program funding directly to changing indicators. When government, foundations, businesses or non-profit organizations tie their granting opportunities to the quality of life indicators, it reinforces the community wide approach to improving outcomes through impacting indicators.

1.5 Outcomes Related to the CAP

The Santa Cruz County CAP has achieved its greatest success in the areas of teen substance use and universal health care for children. Early CAP data about the high levels of teen substance abuse and low levels of health insurance for children acted as a catalyst for change in the county. The United Way used the data to bring dozens of agencies together, including non-profit organizations, county agencies, elected officials and private citizens to develop social and political strategies to impact the problems.

1.5.1 Community Change for Youth and Substance Abuse

The first CAP published in 1995 showed alarming rates of youth who self reported using marijuana and alcohol in the last 30 days. The Santa Cruz County rates were higher than in the state of California. For example, in 1994, 51% of Santa Cruz County 9th graders used alcohol in the last 30 days as compared to 44% of California 9th graders. Similarly, 40% of Santa Cruz County 11th graders reported using marijuana in the last month as compared to 26% of California 11th graders.

In 1995, the United Way used the CAP data to mobilize a coalition of 110 agencies and individuals called Together for Youth/Unidos Para Los Jovenes (TFY/UPLJ) to seek solutions to youth substance abuse. The group used Results Based Accountability (RBA) a methodology, developed by Mark Friedman, to make program or community change by developing shared outcomes and working backwards from outcomes to particular action strategies. The United Way of Santa Cruz County and Applied Survey Research (ASR) had both been working extensively with RBA and incorporated RBA strategies into the work of the Together for Youth collaborative. RBA includes several steps: Identifying shared program or community outcomes; identifying indicators to measure current and future conditions; collecting baseline data; determining the story behind the baselines; determining the partners that have a role to play in improving outcomes; determining the best ideas to impact outcomes; and developing an action agenda to attain the outcomes. The Together For Youth group had several shared outcomes including the promotion of health behaviors for youth and decreasing the use of substances including alcohol and drugs. The group had baseline data from the CAP and appropriate indicators to track substance use over time. The United Way invited a wide range of partners from many different fields to help to impact youth substance abuse. The partners decided to focus on increasing youth skills, confidence and abilities, and to reduce risk factors. The group developed seven strategies including new laws, public education, a grand jury report, youth leadership training, referral and home visiting programs, new teen centers and treatment services, and a public policy panel on youth access to alcohol. The public policy panel developed recommendations for schools, law enforcement, land use/zoning, and businesses. Since 1997, over \$1 million was raised to support activities devoted to teens. After 1996, the previously increasing trend lines in teen substance use began to decline. Since then, subsequent CAPs have shown consistent

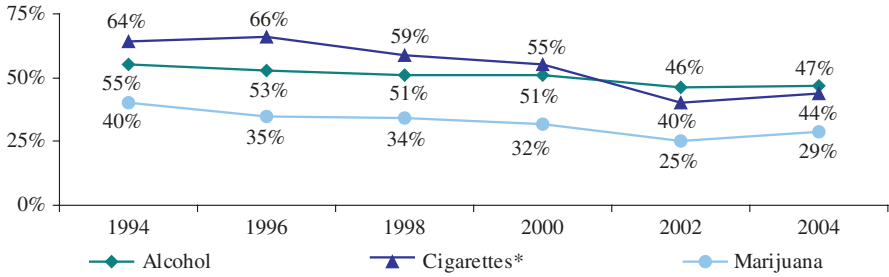


Fig. 1.1 Percent of Santa Cruz County 11th graders reporting substance use in the last 30 days
Notes: * Cigarette use is the percentage of students reporting “ever using” cigarettes.
Source: The American Drug and Alcohol Survey, 1994–1998. California Healthy Kids Survey, 2000–2005.

decreases in overall alcohol and drug use among 9th and 11th grade students. Substance use has also decreased in the state of California as a whole, but the decreases in Santa Cruz County are larger than the decreases in the state.

Figure 1.1 below shows a dramatic decline in the use of alcohol, marijuana and cigarettes for 11th graders since the first CAP was released.

Figure 1.1 shows substance use for 11th graders, but ninth grade students in Santa Cruz County also showed similar declines, from 51% using alcohol in 1994 to 33% in 2004. Thirty-five percent of Santa Cruz County 9th graders used marijuana within the last thirty days in 1994, declining to 18% in 2004. Overall use declined dramatically, but data also showed a trend towards more binge drinking among those youth who did use alcohol. Those data led to a new effort to stop binge drinking, which will be described in the next section of this report under New Initiatives.

1.5.2 Community Change for Children and Health Care

The CAP data findings also led to a change in the way health care is provided to children in the county. In 1995, there were no local data showing the level of health insurance coverage in the county. The 1995 CAP telephone survey included a question asking individuals if they had health insurance and over 25% of respondents said they did not have health insurance. These alarming data acted as a catalyst for CAP stakeholders, the United Way and other organizations to call a summit conference to decide how to improve health care coverage in the county. CAP stakeholders decided to set a goal of universal health care in the county, and summit conference participants agreed to begin with universal health care for children. The release of the CAP findings in 1995 created an alarm to local citizens and community groups that also dovetailed with the efforts of First 5 California. First 5 California is an initiative also known as Proposition 10, which was passed by voters to add a tobacco tax. The tobacco tax is then used to benefit children prenatal-5 years old and their families. One of First 5 California’s goals is to promote the health status of young children.

After the release of CAP data on the lack of health insurance coverage, and the summit conference on health where participants decided to focus on health care for all children, several organizations including the Santa Cruz Community Foundation, the United Way and First 5 Santa Cruz County launched efforts to offer health care to all children. The United Way and First 5 Santa Cruz County work very closely together; the United Way has some oversight in the process of staff hires for First 5 and the two organizations share staff. First 5 Santa Cruz County funded their thirty grantee organizations to participate either directly or indirectly in the goal of health care for all children. Many First 5 programs offer direct assistance in accessing insurance and health care through outreach and enrollment in children's health insurance for children birth to 5 countywide. In addition, most programs funded by First 5 are required to collect information on children's health insurance and refer children and families to public health insurance options. For example, family advocates in all First 5 funded home-visiting programs provide information about health insurance to families and assist in accessing enrollment. Programs are also leveraging First 5 dollars to draw down Medi-Cal Administrative Activity (MAA) funding to support children's access to healthcare.

As a result of the CAP findings, the health summit, and First 5's countywide efforts to improve children's access to health insurance, now more children are covered by public health insurance. As of 2005, there were 4,681 children enrolled in the low-income health care plan for children who did not qualify for Medi-Cal, a 358% increase from 1,023 children in 1999.

In 2004, health insurance coverage data from CAP also supported the creation of a coalition of over twenty organizations to launch a new initiative to create an insurance program for children at or below 300% of the federal poverty level, regardless of immigration status. As in California as a whole, there are many children in Santa Cruz County who do not have legal immigrant status. There are an especially large number of Latino families in the southern part of the county who are agricultural workers, including some who are migrant farmworkers. Local community members wanted to develop an insurance program to cover those children. The Healthy Kids Health Plan began in July 2004 with 28 children ages 0–5 and by January 2005 had 1,050 children enrolled in the non-profit HMO program that offers medical, dental, vision and mental health coverage. Santa Cruz County is one of the first counties in California to offer its own health insurance program to alleviate health disparities, especially for low-income Latino immigrant children.

1.5.3 Catalyst for New Initiatives: Binge Drinking

In addition to the community changes observed in the areas of youth substance abuse and children's health insurance, there are many new initiatives which have emerged from CAP data. The youth substance abuse figures showed a steep decline from 1994 to 2004, but there was a simultaneous troubling finding in the area of youth binge drinking. Youth overall were using alcohol less, but the youth that did use alcohol were bingeing more, where they drank five or more drinks within a

two hour period. Santa Cruz County is the 6th worst county in California for binge drinking rates for residents ages 18–34. The alarming binge drinking rates motivated the youth substance abuse coalition to turn to the topic of binge drinking. The coalition applied for and received a three-year grant from the California Department of Alcohol and Drug Programs to provide a needs assessment and identify and implement environmental prevention strategies for binge drinking. The group is called Community United to Reduce Bingeing (CURB). In order to implement effective approaches, CURB narrowed the target population of its efforts to youth under the drinking age of 21, specifically to youth ages 16–20. CURB is also using Results Based Accountability strategies to determine shared program and community outcomes and work backwards to develop strategies to attain those outcomes. CURB's goal is to decrease binge drinking in this age group by 50% in three years. ASR will evaluate CURB's progress and report data on binge drinking in upcoming CAP reports.

1.5.4 CAP Efforts Lead to Initiative on Childhood Obesity

CAP data in 2002 showed especially alarming percentages of obesity among children and adults. The county ranked at the bottom at 63rd of California's 66 counties and health jurisdictions for overweight children aged 5 to under 20 years old. These data findings galvanized the United Way of Santa Cruz County and several other organizations to convene a group of over 150 members in a new countywide initiative called Go For Health. Members represent elected officials, hospital and health providers, K-12 schools, non-profit organizations, city planning, the food bank, farmers, child care providers, researchers and county agency staff. The Go For Health initiative is also based on the Results Based Accountability method to make community change by agreeing upon shared outcomes and working backwards to develop specific action plans, invite appropriate partners, describe baseline data, and track indicators for the shared outcomes. The group spent nine months developing a plan with 24 outcomes and action steps to increase children's healthy eating and physical activity.

Go for Health action steps include providing culturally appropriate health education and cooking classes, promoting physical activity, integrating nutrition information at school, assisting schools in providing healthy food, and advocating for better local and statewide legislation such as more pedestrian friendly cities. Staff of the Go For Health Initiative are working closely with the California State Assembly member for Santa Cruz County to craft new state legislation to encourage healthier eating under government food programs, as well as making it easier to apply for food stamps and maintain eligibility. One recent California legislative success was to allow food stamp recipients to use their Electronic Benefit Cards at farmers markets so that recipients could buy good quality, organic and local produce. Many of Santa Cruz County's farmers markets now have the technology to allow food stamp recipients to use their benefit cards to buy produce. Go for Health is providing outreach to low income Latino communities in the county that have especially high

rates of obesity and diabetes. One strategy includes working with owners of mobile food vans that supply fast food to farm workers, in order to offer more healthy food alternatives. Additionally, Go For Health offers a cookbook in Spanish for how to make traditional recipes with lower fat methods. There is also a Latino Five a Day program that encourages Latino community members to eat from 5 to 8 servings of fruit and vegetables each day.

1.5.5 Homeless Census and Survey

CAP data revealed higher levels of homelessness than were expected in Santa Cruz County. In response to those higher rates of homelessness, county agency staff and representatives of non-profit organizations wanted more detailed data about the homeless population, including how long they had been homeless, what factors led to their homelessness, the demographics of the population, as well as their family status and health status. The desire for more data led to two new efforts, one was to conduct a countywide homeless census and survey, and the second was to add questions about homelessness to the CAP resident survey, which had been conducted every year.

The county, therefore, embarked on its first systematic effort to provide a detailed census and survey of the homeless population in 2000. A prior homeless survey had been conducted in the early 1990s but it was not as comprehensive and detailed as the 2000 survey. ASR was hired as the research partner in the effort and created a unique methodology to hire homeless individuals to help in the effort. The belief is that homeless people have the greatest knowledge about the overall homeless population including the places that homeless people sleep at night, the encampments they create, and more detailed information about their lives. Homeless individuals were hired and trained to participate in both the census of the homeless population as well as a detailed survey of the homeless. The census was conducted at one point in time, by using homeless workers and volunteers to canvas the entire county to count all the homeless people. That point in time visual count was supplemented by telephone calls to hospitals, shelters, treatment centers, and the jails to get accurate counts of their homeless populations. Subsequently, homeless workers and social service providers conducted individual one-on-one surveys with homeless individuals. As previously mentioned, the survey contained questions about the demographics of the homeless population, whether the individual was working, their health status, their educational attainment, their family status, whether they had children staying with them, their use of substances, their mental health status, and whether they had suffered from domestic violence. The study provided much more detailed information to allow city and county planners and social service providers to have a more accurate picture of the homeless population in order to provide better services. The homeless data helped to provide the impetus for new shelter services, including a new residential homeless shelter for individuals and families, new funding for transitional housing, more permanent supportive housing, and the Homeless Person's

Health Project of Santa Cruz County. There has been approximately \$1.5–\$2 million more dollars for homeless funding since the 2000 homeless census and survey.

The homeless census and survey was repeated in Santa Cruz County in 2005. The methodology has been listed by the United States Department of Housing and Urban Development as a best practice and ASR has conducted similar studies in other California counties such as Monterey, San Bernardino, Mendocino and Santa Clara County, including the largest municipal housing study in the country, in Los Angeles County in 2005.

1.5.6 Data Gaps Lead to Other New Studies

In addition to the homeless study, CAP data led to other new survey efforts in the areas of farm workers, children who witness domestic violence, rape victims and the disabled.

Santa Cruz County has a large population of farm workers and migrant farm workers, however, county staff and the staff of non-profit agencies did not have an adequate picture of the lives of farm workers. This gap in the data led to a call for further research into the farm worker population, a study of which was completed in 2001.

The CAP revealed other data gaps such as with victims of domestic violence and their children and more recently for people with disabilities. ASR, the research partner on the CAP, was also conducting evaluations in the surrounding counties about the co-occurrence of domestic violence and child maltreatment. Historically, those two populations had been treated separately through separate county and non-profit agencies. But recent research shows that in a national survey of 6,000 American families, 50% of men who frequently abused their female partners, also abused their children (Peled, Jaffe, & Edleson, 1994). Further, children who witness abuse between their parents, frequently experience behavioral and emotional problems, such as aggression towards others, withdrawal, low self-esteem, and lower school achievement. Santa Cruz County did not have detailed data about the co-occurrence of child maltreatment and domestic violence, so CAP stakeholders decided to add indicators to the CAP to capture those data, including new questions on the resident surveys.

In the most recent CAP Stakeholder Survey in 2003, several key respondents requested more data about people with disabilities in the county. It appears likely that new indicators in 2006 will be added in order to collect more data about people with disabilities. Disability advocates are also planning on adding new goals to the CAP in 2006 and are contemplating further studies of people with disabilities in the county.

In 2005, crime data from the CAP showed an overall declining trend line in all violent crime in the county, except for rape. In 2005, the CAP findings for rape were especially alarming and drew the attention of the media as well as more calls for research by advocates. This led to a new study of rape that will be released to the Santa Cruz City Council in the Spring 2006.

1.5.7 CAP Leads to Public Information

The CAP acts as a rich data resource for the media, elected officials, community leaders, county agency staff, non-profit organizations, businesses and the public. In the area of the media, the publisher of the local newspaper the *Santa Cruz Sentinel* sits on the CAP Steering Committee and the newspaper reports on some data highlights from the CAP. The newspaper also requests that readers nominate community heroes for the CAP and then profiles the winners. Further, several of the newspaper reporters have copies of the CAP and will refer to it in stories that they cover throughout the year, such as teen pregnancy, crime rates, binge drinking, substance abuse and obesity rates. Typically, the CAP data show up in approximately 8–10 stories a year, but the source of the data is not always included. There are three county weekly newspapers, two of which cover highlights of the CAP. Two local radio stations provide coverage of the CAP including the local National Public Radio (NPR) affiliate and a popular commercial AM Talk-radio show. The radio coverage typically highlights the community heroes and specific data findings. The two regional commercial television stations are invited to the press conference, and one station generally covers the CAP by highlighting one piece of data, such as rape statistics in 2005 or teen pregnancy in 2004. The community cable television station films the CAP event every year and broadcasts the event several times over the course of the year. Since 2003, CAP stakeholders have worked more closely with the local media, including providing briefings on CAP data to the editorial board of one daily newspaper and briefings to individual reporters from print press, radio and television. The result of these efforts has been more coverage of CAP events and CAP data. One daily newspaper, for example, published approximately 8 articles about CAP heroes directly after publication of the CAP report in 2004.

Many public officials and/or their staff members attend the yearly press conference and are provided with free copies of the CAP. Typically, some city council members for each of the four cities in the county attend the event, and often several members of the County Board of Supervisors will attend the event. The United States Congressman, the California state senator and assemblymen generally send their staff members to the event. The CAP Stakeholder Survey included several legislators who said that they relied on the CAP data. Anecdotally, legislators tell CAP stakeholders that they use the CAP data for speeches, talking points, and as a resource for legislation.

1.6 Summary and Conclusions

The Santa Cruz County Community Assessment Project has acted as a catalyst in creating new effective programs in the areas of teen substance use and offering universal health care to all low-income children in the county. The CAP data have revealed poor outcomes for youth in terms of substance use and the CAP telephone survey showed for the first time the low levels of health insurance coverage in the county. The CAP has also led to new initiatives to reduce binge drinking and

obesity as well as contributing to a data development agenda. On a budget ranging from \$60,000 to \$75,000 each year, Santa Cruz County has been able to compile a rich data document and encourage community wide change. In fact, the United States General Accounting Office (GAO) has mentioned the Santa Cruz County CAP project in one of their reports about best practices for indicator reports and staff of the GAO interviewed CAP stakeholders and ASR staff about the history of the CAP. To summarize, the CAP has contributed to changes in the following areas:

- Reduced substance abuse among youth;
- The development of the Healthy Kids Health Plan of Santa Cruz County to ensure all children in the county have health insurance;
- An initiative to reduce youth binge drinking;
- An initiative to promote nutrition and physical activity to reduce childhood obesity;
- A strategic plan to improve elementary school attendance;
- Research on specific vulnerable populations such as the homeless, agricultural workers, rape victims, and people with disabilities;
- Data development work to fill in data gaps, for example, developing data on children who witness domestic violence;
- An annual community celebration and data sharing event;
- An executive summary that goes to every home in Santa Cruz County;
- Awards for Community Heroes – individuals and organizations serving the county and working towards the Community Goals; and
- Project evaluation on an ongoing basis to ensure the project is meeting stakeholder and community commitments.

The Santa Cruz County CAP stakeholders were aided in their community initiatives by the use of Results Based Accountability (RBA), a method of making change that begins with shared outcomes and works to develop action plans to achieve these outcomes. RBA was especially critical to the success in reducing youth substance abuse and in the development of a new countywide initiative to reduce obesity. The CAP partners have had very limited funding to achieve these substantial outcomes, but the leadership of the United Way of Santa Cruz County and concerted community efforts from 110 organizations in the case of teen substance use and 150 organizations in the case of reducing childhood obesity, were the keys to turning the curves in the community. The CAP has drawn on several of the most successful community indicator projects in the country and may want to consider borrowing additional strategies from the Jacksonville and Truckee Meadows projects such as: limiting the number of indicators to allow the community to focus action plans on fewer indicators; expanding data presentations for how to use the CAP to grantees, non-profit agencies and businesses; seeking new funding from state and federal sources; and encouraging the county and other non-profit agencies to fund their grantees by requiring that grantees focus on impacting specific indicators.

Community indicator projects often take a long time in their start-up phases, to develop indicators, achieve community wide support, become ingrained in public perception and the media, and act as rich data resources for the community. The

CAP was successful in accomplishing these outcomes in a relatively short time frame, as compared to other community indicator projects. Many community indicator projects stop at the data phase and do not develop into mechanisms for program, social or political change. Santa Cruz County was able to move successfully from data to action on behalf of children, youth and families.

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Chapter 2

Pace of Life and Quality of Life: The Slow City Charter

Heike Mayer and Paul Knox

Abstract This chapter introduces the Slow City movement and presents case studies of Italian, German, and British towns. The Slow City movement – sometimes also called *Città Slow* or *Città Lente* – began in October 1999 when four Italian towns started to apply the ideas of Slow Food to urban planning. Since then, more than 77 cities have joined and are committed to implementing a charter and adhere to a 54-point criteria list. The criteria represent a unique community quality-of-life indicator system that addresses issues of environmental protection and sustainable urban development, urban design and form, the support of local products, and educational awareness. The Slow City charter forms the philosophical basis for a set of action-oriented indicators. Member towns are obliged to pursue local projects that protect local traditions and cultures, contribute to a relaxed pace of life, create conviviality and hospitality, and promote a unique sense of place and local distinctiveness. We describe the Slow City Movement approach to indicator systems that strives for broad sustainability and place-making goals and deep commitments to policy action.

2.1 Introduction

The attributes of localities have long been recognized as important dimensions of the quality of life of their inhabitants and of their community as a whole (Smith, 1973; Knox, 1975). For the most part, however, place-based quality-of-life indicator systems – “territorial social indicators” – have been focused on aggregate attributes of places and regions in terms of housing conditions, morbidity and mortality rates, educational attainment, income levels, the incidence of crime, and so on (see, for example, Broadway, 1989; Pacione, 1990; Petrucci & D’Andrea, 2002) or on subjective indicators of satisfaction with community-based services, amenities, and opportunities (see, for example, Sirgy, Rahtz, Cicic, & Underwood,

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2000; Bramston, Pretty, & Chipuer, 2002; Jacob & Willits, 1994). In recent years, the homogenizing effects of economic and cultural globalization have resulted in much greater awareness of some of the more specific and unique attributes of places: their distinctiveness, sense of place, and cultural heritage. Meanwhile, the increasing speed of contemporary communications technologies and increasing stresses associated with contemporary business practices have resulted in much greater awareness of the pace of life and conviviality associated with particular places, and of issues relating to economic and environmental sustainability. In this chapter, we describe the quality-of-life indicator system that has been developed as the basis for the Charter of the Città Slow (Slow City) movement, an international network of small towns with a strong commitment to a view of quality of life that is inherently place-based. The Slow City movement incorporates a philosophy and a commitment to maintain the cultural heritage and quality of life of their membership towns. The movement uses a quality of life indicator system to certify and reassess its members. However, it goes beyond quantifiable measures typically used in community indicator systems because the movement is grounded in a charter, which defines normative criteria for policy action. It is this link to action that holds the potential for effecting change, going beyond the descriptive nature of indicators to one that is explicitly normative. In doing so, the Slow City indicators are directly linked to action plans. To gain the Slow City certification, towns must show a certain level of commitment towards the implementation of the charter.

The Città Slow movement is a reflection of how much places matter to people. People's physical well-being, opportunities, and lifestyle choices are all affected, for better or worse, by the particular attributes of specific places. Equally important, people's experience of everyday routines in familiar settings leads to a pool of shared meanings. People become familiar with one another's vocabulary, speech patterns, dress codes, gestures, and humor, and with shared experiences of the physical environment such as streets, markets, and parks. Often this carries over into people's attitudes and feelings about themselves and their locality and to the symbolism they attach to that place. When this happens, the result is a self-conscious sense of place: the feelings evoked among people as a result of the experiences and memories that they associate with a place (Arefi, 1999; Erickson & Roberts, 1997; Jivén & Larkham, 2003).

2.2 The Fast World and Placelessness

Over the past couple of decades, however, people and places have been confronted with change on an unprecedented scale and at an extraordinary rate. Economic and cultural globalization has resulted in a "network society" dominated by flows of capital, ideas, and people (Castells, 1996). Globalization has generated a world of restless landscapes in which the more places change the more they seem to look alike and the less they are able to retain a distinctive sense of place.

The pivotal moment was the "system shock" to the international economy that occurred in the mid-1970s. World financial markets, swollen with US dollars by

the US government's deficit budgeting and by the huge currency reserves held by OPEC countries, quickly evolved into a new, sophisticated system of international finance, with new patterns of investment and disinvestment that led to some radical socio-economic changes. Neo-liberal social formations emerged as part of new, post-industrial societies in most OECD countries. New urban forms began to emerge in response to the new economic logic and the new social structure. A novel, transnational material culture evolved around the consumption of globally branded products. And, as financial investments accelerated around local, national, and international circuits of capital, so the pace of everyday life quickened (Virilio, 1991), accompanied by the attenuation of community social life (Augé, 1995; Putnam, 2000). Innovative information and communication technologies such as the Internet and its antecedent infrastructure allowed for the global expansion of business activities and manifests itself in the emergence of technology regions all around the world.

As a result of globalization, an increasing division now exists between the "slow world" and the "fast world" (Knox & Marston, 2006). The slow world consists chiefly of the impoverished places and regions within less-developed countries and accounts for about 85% of the world's population. The fast world consists of people and places directly involved, as producers and consumers, in transnational industry, modern telecommunications, materialistic consumption, and international news and entertainment. Within the fast world there is now an intense connectedness that ties together 800 million or so of the world's people through global networks of communication and knowledge, production and consumption. In the global economic system, time costs money, and the inevitable result is a steady acceleration in the pace of life.

Another outcome of globalization is the trend towards homogenization. Through increased connectedness, communities are losing their distinctive characteristics because global habits are spreading. One example of this diffusion is the proliferation of fast food places. The global spread of foodstuff threatens local producers and consumers, as well as traditions developed around food production and consumption. The Slow City movement represents immediate action against such "McDonaldization" of society (Ritzer, 2004) and represents a resistance to the increased pace of life and "placelessness."

2.3 Pace of Life and Quality of Life

Yet the faster the information highway takes people into cyberspace, the more they feel the need for a subjective and authentic setting – a specific place or community – they can call their own; and the faster the pace of life in search of profit and material consumption, the more people value leisure time. Similarly, the more universal the diffusion of material culture and lifestyles, the more local and ethnic identities are valued. And the faster their neighborhoods and towns acquire the same generic supermarkets, filling stations, shopping malls, industrial estates, office parks, and subdivisions, the more people feel the need for enclaves of familiarity, centeredness, and identity.

The study of urban rhythms and the pace of life is becoming important in contemporary urbanism (Allen, 1999; Godard, 1997). The rhythms, sequences, and synchronies of a place are the coordinates through which inhabitants frame and order their experience, which in turn contributes to their quality of life (Amin & Thrift, 2002; Levine, 1997). The increased pace of life, meanwhile, has become an issue associated with stress, morbidity and mortality in cities (Garhammer, 2002; Sadalla, Sheets, & McCreath, 1990). Nowhere has this been taken more seriously than in Europe. France, for example, has become known for what might be called slow economics: short hours, long vacations and strong government protection for jobs and industries. In 2000, the French government cut the workweek to 35 hours for employees of larger companies, allowing employers to institute weekend, evening and holiday shifts, and encouraging workers to spread out vacations (Alesina, Glaeser, & Sacerdote, 2005).

Nevertheless, speed has become the dominant and controlling element of Western culture and Western economies (Gleick, 1999; Virilio, 1991). The counterargument – in praise of slowness – has been articulated above all as a quality-of-life issue (Honoré, 2004), and has found expression in two fledgling social movements: the Slow Food movement and the Cittaslow movement. The commitment of the Cittaslow movement to quality of life is reflected in their prototype community quality-of-life indicator system, which is used both as a screening device for membership and as a template for community development and urban planning. The Cittaslow indicator system promotes local economic, environmental, and social sustainability by encouraging multiple actions sponsored by multiple agents and agencies. It is, moreover, oriented more toward achieving philosophically-grounded processes, rather than normatively-established outcomes. The case studies presented here illustrate how small towns are implementing the indicator system to assess the degree to which they are able to decrease the pace of life and increase quality of life in the context of globalization. By highlighting these examples, we present best case studies of indicator systems that guide urban planning and community development decision making.

2.4 The Slow City Movement

The Slow City movement is a direct descendant of the Slow Food movement. Italian journalist and food writer Carlo Petrini, aghast at the announcement of plans to open a McDonald's restaurant in the Piazza di Spagna in the heart of Rome in 1986, was the founder of the Slow Food movement. His reaction struck a chord with many others in Italy, who viewed fast food as culturally invasive and corrosive, a serious threat not only to healthy diets but also to the sociability of eating and to valued patterns and rhythms of life. The Slow Food movement was officially launched in 1989 with a manifesto that states its aim as "rediscovering the flavors and savors of regional cooking and banishing the degrading effects of fast food." The Slow Food philosophy is what Petrini calls *tranquillo* – calm, unhurried, and restorative of body

and soul. There are now 80,000 members who organize in over 800 local chapters – so-called *convivia* – in more than 100 countries (Slow Food, 2006).

While the Cittaslow movement shares the same geographic and cultural roots as the Slow Food movement, the aims of the two movements are different but complementary. In broad terms, both organizations are in favor of local, traditional cultures, leisurely consideration, enjoyment, and conviviality. Both are against big business and globalization, though their driving motivation is not so much political as ecological and humanistic. Authenticity is slow; standardization is fast. Individuality is slow; franchises are fast. Silence is slow; noise is fast. Trees are slow; concrete is fast. Cycle paths are slow; parking lots are fast.

The Cittaslow movement began in October 1999, when Paolo Saturnini, mayor of Greve-in-Chianti, a Tuscan hill town, organized a meeting with the mayors of three other municipalities (Orvieto, Bra, and Positano) to define the attributes that might characterize a *città lente* – slow city. At their founding meeting in Orvieto, the four mayors committed themselves to a series of principles that included working toward calmer and less polluted physical environments, conserving local aesthetic traditions, and fostering local crafts, produce, and cuisine. They also pledged to use technology to create healthier environments, to make citizens aware of the value of more leisurely rhythms to life, and to share their experience in seeking administrative solutions for better living. The goal is to foster the development of places that enjoy a robust vitality based on good food, healthy environments, sustainable economies, and traditional rhythms of community life (Cittaslow, 2006).

These ideas soon led to a Charter and a 54-point indicator system that leans heavily towards the fostering of conviviality and the promotion of high-quality local produce. The charter represents the broader philosophy of the movement and should be read as a blueprint or a roadmap for future urban development. It outlines the obligations for a Slow City regarding environmental protection and sustainability, as well as quality of life, conviviality, and hospitality. The indicators or criteria list is the tangible application of the charter's philosophy and helps the movement with the certification of new members. It is also used to assess members in terms of the progress they make along the various dimensions. To be eligible for membership, candidate cities must have no more than 50,000 inhabitants and must pledge to introduce a range of measures from the promotion of organic agriculture to the creation of centers where visitors can sample local traditional food. They must also take steps to protect the sources and purity of the raw ingredients and to fend off the advance of fast food and cultural standardization.

Promoting local distinctiveness and a sense of place is almost as important as the promotion of conviviality. This means that the Charter also covers many aspects of urban design and planning. Candidate cities must be committed not only to supporting traditional local arts and crafts but also to supporting modern industries whose products lend distinctiveness and identity to the region. They must also be committed to the conservation of the distinctive character of their built environment and must pledge to plant trees, create more green space, increase cycle paths and “pedestrianized” streets, keep piazzas free of advertising billboards and neon, ban car alarms, reduce noise pollution, light pollution and air pollution, foster the use

of alternative sources of energy, improve public transport and promote eco-friendly architecture in any new developments. The movement subscribes to the management standards embodied in International Organization for Standardization's ISO 9000 – the international reference for quality management referencing in business dealings – and to the management and monitoring standards of ISO 14000 for organizations to meet their environmental challenges.

Membership of the Cittaslow movement is carefully controlled, and cities are admitted to membership only after trained local “operatives” have prepared an initial report on the city's commitment to Slow City principles, followed by a detailed audit report using a community quality-of-life indicator system covering six key areas: environmental policies and planning; use of infrastructure; integration of technology; promotion of local produce and ways of life; hospitality and the rhythm of life; and sense of place. Each national network of member towns, and each individual town, must develop a set of indicators based on the Charter. It is recognized that the special characteristics of individual places may mean that the indicator set varies in detail from one application to another, but each set must cover each of these six areas (an example indicator system is shown in Table 2.1). The movement is governed by an elected assembly of ten city mayors, with a president, three vice-presidents, and a chief operating officer – all of whom serve on a voluntary basis.

In 2001, the first 28 Slow Cities were certified. All 28 charter members were Italian, the majority of them located in northern Italy, particularly in Tuscany and Umbria. By 2006, more than 77 cities had been certified as Slow Cities (Cittaslow, 2006). The majority are located in Italy, but towns in Germany (Waldkirch, Hersbruck, Schwarzenbruck, and Überlingen), Norway (Levanger and Sokndal), and the United Kingdom (Ludlow, Aylsham, and Diss) are now certified as Slow Cities. More than 300 other towns from around the world have inquired about joining and existing certified Slow Cities enjoy a steady stream of local and international visitors interested in the movement.

As the movement has spread and become international, so has its organization and certification process. Slow Cities in Germany have organized a non-profit group to manage the German chapter. They have translated the Charter into German and have adapted it to the national context. For example, unlike the Italian charter, the German charter includes an indicator that notes whether a town has a policy in place that bans genetically modified plants and organisms in the local agricultural economies. The Slow City of Überlingen was the exemplar for this indicator since the town was the first in Germany to ban genetically modified organisms (GMO) within its perimeter. The GMO ban fits the overall ideas of Slow Food and the addition of a new indicator shows that countries are encouraged to adapt the system to their own needs. In general, the six key areas remain the same, but the overall number and type of indicators changes slightly in the context of each national framework as each country develops its own Slow City organization. For example, if a German town wants to become certified as a Slow City, it will need to apply to the German chapter of the movement. According to the Slow City indicators in the German charter, cities first need to conduct a self-assessment. An on-site visit by a delegation of Slow City representatives follows this assessment and will

Table 2.1 Example of a slow city indicator and point system

Criteria	Weight	Assessment Score	Ideal	Max (weight × ideal)
Environment				
System for air quality testing and reporting	2		3	6
Programs in support of new composting technologies, support for composting in individual households	3		3	9
Support for alternative, renewable energy sources in the city	3		3	9
Local ban of genetically modified foods and organism in agriculture	3		3	9
Water management: Protection of drinking water, sewage treatment, and use of rain water	3		3	9
Programs eliminating negative influences on urban design, i.e. aesthetically displeasing advertisements	2		3	6
Control systems and measures to limit electro smog	2		3	6
Prevention of noise and measures to reduce noise	3		3	9
Light pollution measurement and prevention	2		3	6
Application of governing laws EMAS or ISO 9001; ISO 14000; and SA 8000	3		3	9
Participation in the Agenda 21 project				
Total environment	26		30	78
Infrastructure				
Urban revitalization and historic preservation	3		3	9
Programs to minimize traffic and support of a pedestrian environment and alternative mobility (bike paths, public transportation, traffic calming, etc.)	3		3	9
Access and availability of public spaces for the handicapped	3		3	9
Family-friendly city: Support of social services to all socioeconomic groups	3		3	9
Provision of sufficient public green spaces within the city	3		3	9
Regulations for delivery traffic	2		3	6
Implementation of a schedule of opening and closing hours for the commercial interests of the town that is in keeping with the needs of the citizens				
Citizen-friendly opening hours for city offices	3		3	9
Existence of a Slow City information office	3		3	9
Total infrastructure	23		24	69

Table 2.1 (continued)

Criteria	Weight	Assessment	Score	Ideal	Max (weight × ideal)
Urban quality (through the use of modern technologies)					
Promotion of eco-friendly architecture	3			3	9
Use of recyclable containers in public structures	3			3	9
Effective litter and waste management	3			3	9
Use of sympathetically designed litter bins					
Use of containers for refuse and their removal according to established timetables					
Support and maintenance of region-specific plants in public and private spaces	3			3	9
Programs to catalogue and protect trees and green spaces					
Development of a city-wide internet-based network for citizens (Webpage, e-government, etc.) and advertisement of these efforts	2			3	6
Total Urban Quality	14			15	42
Encouragement of local produce and products					
Programs to support organic agriculture and certification of products. Ban of genetically modified products	3			3	9
Protection of and support for products and production techniques representing local tradition					
Implementation of concepts for use of local products in local restaurants (including refectories and cafeterias)	3			3	9
Educational programs about food, nutrition and taste in cooperation with Slow Food	3			3	9
Slow Food project for the preservation of unique local foodstuffs and traditional production techniques in danger of extinction	3			3	9
Implementation of an annual census of local products	2			3	6
Creation of market opportunities for natural and local products (i.e. farmer's market, etc.)					
Initiatives to encourage the protection of local products and handicrafts	2			3	6
Implementation of programs that emphasize and conserve local cultural traditions and events	3			3	9
Total local produce and products	19			21	57

Table 2.1 (continued)

Criteria	Weight	Assessment Score	Ideal	Max (weight × ideal)
Hospitality				
Education and training of city staff about Slow City ideas and programs	3		3	9
System for verification that local government and local businesses are honest in their signage and that there is no false advertising	3		3	9
International signage and sustainable urban design concept for signage	3		3	9
Existence of well-marked tourist routes with information and description				
Policies for hospitality:	3		3	9
Existence of a policy for facilitating visitor access during events and celebrations.				
Availability of guarded car parks in areas near the city center				
Existence of brochures to the “slow” guide to the city	2		3	6
Slow tours in the city				
Existence of a web-based homepage				
Total hospitality	14		15	42
Awareness				
Existence of programs to involve citizenry in the implementation of Slow City philosophy and criteria	3		3	9
Extensive public relations efforts about Slow City	3		3	9
Total awareness	6		6	18
Total points			111	306
After slow city certification				
Presence of the Slow City logo on official documents of the city				
Web Site dedicated to the Slow City programs in the city				
Regular assessment and evaluation of the city’s conformance with Slow City criteria and up-to-date status reports				
Support of local Slow Food groups				

Source: Cittaslow (2006).

determine whether the town will become certified. With the internationalization of the movement, the organization has become decentralized. Close contacts across the borders, primarily between city officials, ensures the cross-fertilization of ideas and cross-cultural learning. Italian towns, for example, have become very interested in German best-practice approaches to environmental management such as waste management and recycling.

When a city seeks to join the movement, it has to undertake a self-assessment using a four-point scale (0–3) for each of the indicators. The scale reflects whether a Slow City indicator is fully or partially implemented as a policy or a program, planned for, or not addressed at all. The self-assessment would register the maximum of three points if a town had completely implemented the indicator. Two points are given when an indicator was developed and partially implemented. One point is granted if the town had developed the indicator but had not yet implemented it. Zero points are received if the indicator has not been given consideration at all. Depending on the level of implementation, towns would be able to gain an ideal or a maximum level of points. In order to compute the actual score, the observed points for each indicator are multiplied by a weight that assigns importance to the indicator. In the case of the German Slow City chapter, the weights are assigned according to how important the indicator is to the achievement of the Slow City philosophy. Such a system allows for variation among the candidate cities regarding their commitment and implementation efforts of Slow City ideas. Moreover, the weights reward community development and planning initiatives that implement the movement's core goals.

Once a city becomes certified as a Slow City, it has to be re-certified every four years. Typically a city becomes certified after it prepared a detailed assessment of its programs and policies and the ways in which these respond to the set of indicators. Slow City representatives noted that the movement plans to evaluate existing members on a regular basis, but so far such a reassessment has not occurred. Evaluation will, however, ensure that the philosophy of the movement stays alive and develops. Through this process, each Slow City should also be able to document the progress it makes on each indicator. Certified Slow Cities are members of the specific country network of the Cittaslow movement. The yearly membership fee for German towns, for example, ranges from 1,500 Euro to 3,000 Euro depending on population size.

2.5 Implementation of Slow City Charters

The implementation of the Slow City charter varies according to the country and the local context. In the following, we will compare the implementation of quality-of-life indicators in a select number of Slow Cities. Each city has been certified according to the six key areas (environment, infrastructure, urban quality, local products, hospitality, and education). As outlined above, however, the implementation of the Slow City criteria differs from town to town and country to country. The Italian towns, for example, place a greater emphasis on improving environmental aspects such as waste management, eliminating light pollution, and local economic development through tourism. German towns, in contrast, emphasize the promotion of local products and produce, food and nutritional education, and the implementation of alternative energy systems. Differences also exist in how a city is motivated to become part of the movement. Typically, membership is initiated

at the grass-roots level through the mayor, local business representatives, or the local Slow Food convivium. In the case of one Slow City in the United Kingdom, however, membership in the movement was encouraged by a regional development agency.

Consistent with the Slow City philosophy, the movement encourages the development of locally-oriented responses and actions aimed at preserving the uniqueness of a place. Slow City representatives have mentioned that each town could become known for one type of project or a set of projects and serve as a resource for other towns interested in pursuing similar efforts. The goal is to develop a “*tavolo di progetti*” or a table of projects, which will serve as a source of best practices. For example, the English town of Ludlow has developed expertise around farmers markets. Orvieto in Italy is becoming an expert in sustainable transportation and three of the German Slow cities have extensive experience with local, alternative energy systems.

2.6 Case Studies

2.6.1 *Slow Cities in Italy*

With more than 50 Slow Cities, Italy is the forerunner in this movement. The towns we will discuss in this section are Levanto, Castelnovo Monti, and San Miniato and they represent various Italian regions. Levanto is the gateway town to the Italian region of Cinque Terre in Liguria, a province located east of Genoa. The region is known for its steep terraced hills along the Mediterranean coast of Northwestern Italy. Because Levanto is one of a few towns in the Cinque Terre with easy access by train and automobile, many tourists start their vacation here, which often involves hiking along the steep trails through the vineyards of the hills of the Cinque Terre. The Slow Food movement has already been active in the Cinque Terre because wine production on the steep hills of the region became almost extinct and the maintenance of the cultural landscape was in danger (Petrini, 2001). Slow Food promoted the protection of the vineyards by emphasizing the quality of the locally-produced wine, the so-called Sciacetrá wine. Higher quality means higher prices for the wine, which in turn made its cultivation economically appealing. Training courses were made available and over time, the younger generations found winemaking interesting again.

Cinque Terre’s Levanto joined the Slow City movement and with a population of about 5,000, the town’s morphology is characterized by medieval plazas, loggias and churches set along a beautiful wide beach. To protect the town’s quaint character, the city developed a plan for illumination aimed at reducing light pollution. In addition, the town is currently implementing a system for environmental management according to the principles of the ISO. To protect the historic character of the buildings, Levanto is also giving incentives to business owners for façade improvements. Because of its appeal to tourists and a yearly festival that draws more than 10,000

visitors, Levanto has worked with the state railway system to facilitate access for visitors. To foster community economic development through the support of local businesses, Levanto created a central booking system to facilitate the development of a locally based bed and breakfast infrastructure. These programs directly relate to the Slow City charter and show how a tourist-driven small town is facilitating tourism that can benefit small business owners while at the same time retaining a paced and slow quality of life.

Castelnovo Monti's implementation of Slow City ideals is similar to Levanto's. This town is located in the Apennines mountains in the province of Emilia Romagna. Its population is about 10,000 and the town offers tourists plenty of outdoor opportunities and is known for the production of parmesan cheese. Like Levanto, the city is implementing an environmental management system. In addition, the town is raising awareness among its citizens about domestic water management and ways to reduce water consumption. The town has also organized a series of meetings with the local tourism industry and restaurants to plan for tourism that addresses the Slow City philosophy. The efforts by Levanto and Castelnovo Monti illustrate how the Slow City charter and its quality-of-life indicators can facilitate town planning that is aimed at environmental sustainability and the promotion of the local small business sector.

San Miniato is a town of about 26,000 that sits atop three hills in the Arno river valley in Tuscany. The town's history is deeply rooted in its function as an important stop along the trading route between France and Italy. The town is known for its specialty food products such as the white truffle that is grown in the surrounding hills and celebrated at a local festival in November, a sweet raisin wine (*Vin Santo*), vegetables such as olives and artichokes, and specialty cured meats. To protect its historic building character, the city has set detailed criteria for the installation of signs, plaques, and posters and has revised its street signs. To protect views of the town and to limit visual intrusions, the city has incorporated strict regulations about the localization of cell phone towers into the local building code. In accordance with the Slow City goal of promoting local products, San Miniato has drafted a plan for marketing local products. In order to promote region-specific dishes and produce, the town added typical local dishes to the menu in local school cafeterias. With this effort, the town is not only supporting local agriculture, but it is also incorporating food nutrition and taste education and raising the awareness among younger generations for local products and dishes. These are important Slow Food goals that are now implemented on a city-wide scale. Like Levanto and Castelnovo Monti, San Miniato is paying special attention to urban design and is giving incentives for façade improvement in the city center. To accommodate visitors and tourists and not intrude on the urban layout and design, the town has built an underground parking lot with an elevator to the city center. In sum, San Miniato's efforts as a Slow City address all six key areas of the Slow City charter. Moreover, in this case the Slow City status extends beyond a marketing label into the every life of ordinary citizens through the promotion of local dishes and produce in local schools.

2.6.2 *Slow Cities in Germany*

The first Slow City to be chartered outside of Italy was the town of Hersbruck in Germany's southern state of Bavaria. Hersbruck's mayor and local government staff played a pivotal role in writing the criteria list for German Slow Cities (see Table 2.1). They also developed the organizational structure of the movement in Germany. Besides Hersbruck, other German Slow Cities are Waldkirch, Schwarzenbruck, and Überlingen. Scharzenbruck is not actively engaged in the movement and Überlingen has not yet developed an extensive agenda since it joined the movement in 2004.

Hersbruck is located about 30 kilometers east of Nuremberg. This town of about 12,500 residents boasts a medieval city center to which towering gates grant access. Small, intimate roads, alleys and plazas invite people to stop and chat. The town is part of the agricultural and recreation hinterlands of Nuremberg and enjoys a steady stream of weekend visitors. The town has a strong local restaurant and hotel scene and the ratio of jobs to residents is still positive. In Hersbruck, local environmental protection groups have formed strong coalitions with farmers, city government, and small businesses to protect traditional pastureland and orchards. These pastures – also called *Hutanger* – function as green buffers between the city's borders and the agricultural fields and provided open space for the adjacent areas. In the early 1970s, these pastures were abandoned because local residents did not use them for cattle grazing anymore. They became abandoned, turned into urban development spaces, or served as trash dumps. Over the past two decades, a local environmental non-profit group began to raise awareness of the importance of these pastures as open space, and their protection is now an important component of the Slow City agenda in Hersbruck.

In addition, there is a strong emphasis on connecting local farmers as suppliers to restaurants. A network of 29 farmers and 17 restaurants was formed to promote region-specific dishes and local produce. Nutritional education and awareness about local foodstuff is built through a local effort that involves children in a local cooking school run by local chefs who volunteer for this effort. The town is also considering banning genetically modified organisms and products in the cultivation of city-owned land. In addition, to these efforts to promote environmental protection while linking it to local products and region-specific dishes, the town is also active regarding the use of alternative energy systems (wood chip heating technology), the use of local woods in furniture making, and maintaining its urban medieval character through historic preservation.

Waldkirch, Germany's second Slow City, is typical of small towns in Germany's Black Forest. With about 20,000 residents, it is slightly larger than Hersbruck and it sits in a valley amid the steep and forested hills of the Black Forest. The town enjoys proximity to the larger city of Freiburg, which is internationally known for being environmentally progressive. Like other German Slow Cities, Waldkirch boasted a host of programs and projects that were well underway at the time of the Slow City self-assessment.

The town has a long tradition of hosting a farmers' market in the city center on the main square that attracts farmers and consumers from the region. In addition, the town is using localized alternative energy systems in neighborhoods and in public buildings such as schools and gymnasiums. Waldkirch's efforts to integrate disadvantaged socio-economic groups was rewarded with a federal prize, the *Soziale Stadt 2004*, acknowledging the town's attempts to revitalize a neighborhood through the integration of a community development center (the Red House) that integrates housing for the homeless, workforce development projects, a farmers' market, and a soup kitchen.

To promote local tourism and to protect traditional Black Forest farms, the town devised an innovative strategy to connect farms located in the steep hills and isolated valleys to the local sewage system. In exchange for sewage connection – which ensured environmental protection of local streams – local farms were allowed to rent out rooms to tourists. This innovative program ensures local economic development and environmental protection at the same time. Besides environmental sustainability, Waldkirch is also actively promoting social sustainability through place-making strategies. The town is maintaining a lively city center with a plaza that acts as a space for festivals, markets, and events allows residents and visitors alike to interact in an unhurried and undisturbed way. Such “habitual movement around significant places” (Hargreaves, 2004, p. 46) contributes to a sense of place that is the cornerstone of social sustainability in small towns. Waldkirch's efforts to maintain interaction in “ordinary places” (Knox, 2005) extends beyond the central market square and into neighborhoods and neighboring villages whose sense of place is threatened because they are losing vital business functions. In 2005, the town was selected as one of several pilot communities for a state-sponsored project aimed at rebuilding sense of place. The project, roughly translated as “Quality of Life through Proximity” (*Lebensqualität durch Nähe*) reflects the Slow City charter's goal of enhancing local identity and character through increased identification and support for local products and businesses.

2.6.3 Slow Cities in the United Kingdom

Aylsham became the second Slow City in the United Kingdom in 2004 (the first Slow City in the United Kingdom was Ludlow and in March 2006 Diss was named the third Slow City). Aylsham is quite different from the previously discussed German and Italian examples because it does not attract tourists at the same level as the others. However, Aylsham still functions as a small market town and is characterized by a medieval morphology that is centered on three large open spaces, the churchyard, the market place, and an adjacent space for archery butts where target practice with the long bow was held. Despite the lack of tourists, Aylsham supports a range of small locally owned businesses, restaurants and cafes. With the exception of the main supermarket, there are no national retailers or fast-food outlets. In contrast to the Italian and German Slow Cities where the application and self-assessment process was a local grass-roots effort, Aylsham's Slow City status was catalyzed and supported by the regional planning agency. In 2001 Aylsham embarked on a

pilot program, funded by the East of England Development Agency (EEDA) under the Countryside Agency's Market Towns Initiative, to see how market towns like Aylsham would fit the Slow City charter. Diss, a market town some 35 miles to the South, was also selected to pilot the idea. Both towns set up partnerships involving EEDA, the Countryside Agency (the central government's statutory champion and watchdog for rural areas, funded by the Department for Environment, Food and Rural Affairs [Defra]), English Heritage (the central government's statutory advisor on the historic environment), Rural Action East, and the local town council; and both towns were obliged by the funding agency to engage consultants whose remit was to review and evaluate how the Cittaslow charter and Cittaslow membership might complement the policies of central and local governments with regard to English market towns. Both towns also developed steering committees that involved other agencies and organizations, including, in Aylsham's case, Broadland District Council, Norfolk County Council Chief Executive's Department, and the Norfolk County Council Economic and Rural Development Department.

This approach is in stark contrast to the independent approach of Italian or German towns to Cittaslow membership, and reflects the centralized and highly bureaucratized planning system in Britain. Nevertheless, Aylsham officially gained membership of the Cittaslow movement in 2004. A household survey carried out by the Aylsham Partnership in 2002 showed that residents value the town's distinctiveness and its strong community life and that their priorities align closely with the Cittaslow charter and the quality-of-life indicators. They wanted more places to relax in the town center, new facilities, better signposting, protection for historic buildings and increased access to the town's heritage.

With membership of the movement secured, the town has begun to develop several projects designed to promote and reinforce the Cittaslow philosophy. Not least among these is the formation of a Slow Food convivium with a distinctively community-oriented focus. There are plans to close the Market Place for one day each month and holding food, heritage and other events. Cittaslow membership has also given focus to plans for pedestrian safety and traffic management, for town centre enhancement, for a heritage center, and for a social and community project aimed at making information about the town's clubs and societies more accessible and accurate and to encourage these groups to recruit new members.

In sum, these examples from Italy, Germany, and the United Kingdom show that the Cittaslow charter is guiding urban planning and is incorporating important elements of quality of life, slowness, pace of life, conviviality and hospitality, and sustainability. Each case carries a different emphasis on the indicators and key themes, but overall each works towards internationally recognized goals of the charter.

2.7 Slow City as a Quality of Life Philosophy

The cases illustrate that the Slow City charter represents the overarching philosophical goal of the movement. In contrast, the indicator system assesses the degree to which a town is serious about implementing the criteria. It is used in two ways: Cities are certified based on the level of commitment and implementation of the

criteria or indicators. Second, member towns will be evaluated on the basis of the indicator list. In contrast to other indicator systems, the Slow City criteria are indicative of policy action rather than quantifiable and measurable outcomes. The list provides towns with a blueprint for policy action which relates to the overarching philosophy.

Community indicators represent “bits of information that, when combined, generate a picture of what is happening in a local system” (Phillips, 2004, p. 2). These indicators typically describe the status of a community’s well-being by assessing variables such as educational attainment, crime rates, demographic changes, employment levels, income gains or losses, poverty, housing affordability, and environmental pollution and protection (Phillips & Bridges, 2005). Such indicators are used to monitor and evaluate a community’s conditions and if used in a longitudinal fashion, they assess improvements (Hoernig & Seasons, 2005). However, indicators alone cannot change anything – their *use* is what makes the difference. The “challenge to sustainability initiatives in general and indicator initiatives in particular is how do we take the next steps towards realizing the goal of a dynamic sustainable community” (Keough, 2005, p. 89). The Slow City movement and its charter may represent a model for going beyond description by assessing a community’s willingness to nurture a sense of place and engage in “authentic place-making” (Keough, 2005, p. 87) with definitive action plans included as an important component of indicator systems. Moreover, if a town is successfully working on implementing the ideas of slowness, it is rewarded by the membership in an international movement. Membership in the movement allows towns to market themselves as Slow Cities and to carve out a niche in the global urban hierarchy.

In the preceding discussion of the Slow City cases, we have highlighted the normative and action-oriented character of the charter and its indicators. Common to these cases is an assessment of the town’s willingness and commitment to work towards slowing down the pace of life, increasing the uniqueness of the urban experience while at the same time being committed to sustainability. The charter encourages towns to work towards normative goals of increasing quality of life. This contrasts with other types of indicators that typically have been descriptive of the state of a community. The Slow City charter and its criteria list offers an action framework for small towns that want to retain and enhance their identity within a globalizing world. The indicator system is used to gauge the commitment of the towns to the Slow City principles. In doing so, the Slow City indicator system may represent a good example for how communities can link indicators to action plans. The *Community Indicators Handbook* (Smolko, 2000) notes that “indicators do not make change by themselves” and the frontier is to try to use indicators as springboards for policy action (Redefining Progress, 2006, p. III). The process of re-certification and the peer character of the movement hold local government, nonprofit groups, businesses, and citizens accountable in trying to achieve the movement’s goals and not just rest on their laurels once they received their initial certification.

Quality-of-life and sustainability indicators similar to the Slow City system have become commonplace. In North America, examples include Sustainable Seattle and Sustainable Calgary (Keough, 2005). These projects are characterized by a

high level of citizen engagement through an extensive public participation process. Similar to the Slow City charter, they assess the economic, social, and environmental well-being of a community. In the case of Calgary, citizens were asked which initiatives would have a significant positive impact on the sustainability of the community. They expressed interest in improving the community's sense of place, supporting environmental protection, and encouraging a culture of simplicity (Keough, 2005). These priority areas would demand major shifts in lifestyles and the support from urban development policies and programs. Indicators by themselves, however, would not encourage such shifts because descriptive measurements would only assess whether shifts took place or not. The Slow City charter and indicators, in contrast, assess the presence and strength of policies addressing such important quality of life issues. A system that includes measuring implementation might be more powerful in achieving social change than descriptions of well-being.

Innes (1998) noted that indicators only become powerful if they are embedded in institutional practices and thinking. For the Slow Cities discussed in this chapter, the ideas and goals as well as the charter and indicators are strongly supported by local government and the community of stakeholders. After all, in most cases membership was encouraged by these actors. However, in field visits to these towns we have observed a lack of citizen awareness and engagement. In the case of the German Slow Cities, membership was initiated and implemented by a small group of stakeholders that included the mayors, community nonprofit groups, and local business representatives. An understanding and appreciation of the initiative had yet to reach most citizens. If ordinary citizens do not carry the movement, then the ideas of the Slow City will not permeate the lifestyle of the town's residents. As Innes (1998) noted, a shared understanding of the movement and its goals – especially among the broad range of constituencies – is necessary to see improvement and social change.

2.8 Conclusion

The Slow City charter and indicator system acknowledges urban planning with the goal of authentic and sustainable place-making. Instead of pursuing an economic development agenda that tries to attract companies from outside the region (exogenous), the Slow City charter emphasizes endogenous community and economic development opportunities that are embedded in region-specific products, habits, and traditions. The Slow City charter and criteria list assess the development and implementation of planning programs and policies. The emphasis on such programs and policies contrasts with traditional community indicators.

The author Aldous Huxley once said, "Speed provides the one genuinely modern pleasure." Nevertheless, it seems that the European Slow Cities have discovered another pleasure – that of slowing down and appreciating the quality of life an urban environment has to offer. Through the charter and the quality-of-life indicator system, the Slow City movement aims to develop a code of conduct for local

governance. The benefit of an international network of cities is not only the ability to learn from each other, but also to provide for accountability regarding the implementation of the indicators.

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Chapter 3

The Clark County Monitoring System – An Early Warning Indicator System for Clark County, Nevada

Sheila Conway, Jeremy Aguero and Irene L. Navis

Abstract The U.S. Department of Energy proposed shipping 77,000 metric tons of high-level nuclear waste from civilian nuclear reactor sites and weapons facilities from throughout the country through Clark County, Nevada on its way for permanent geological burial at a repository at Yucca Mountain, Nevada. This proposal is met with steadfast concern and opposition by Clark County residents and decision makers. The primary areas of concern include potential stigma-related impacts to the area’s tourism economy, negative quality of life impacts, and public health and safety issues. In response to these concerns, Clark County and its incorporated jurisdictions have developed an indicator based monitoring program that serves as an “early warning system” of changes occurring to the area’s socio-economic, fiscal, environmental, and public health and safety well-being. This chapter discusses the reasons the monitoring program was developed; describes how the monitoring program was designed and implemented; details the components and methodology used in developing each of its components; summarizes the lessons learned in implementing a monitoring program; and concludes with a look forward to the future for monitoring.

3.1 Background

Clark County, Nevada provides services for nearly 1.7 million residents and an annual visitor volume of 42 million tourists and conventioners. Clark County spans over 8,000 square miles in size, roughly the size of New Jersey. For more than a decade, Clark County ranked as the number one or number two fastest-growing areas in the nation. Five incorporated cities lie within Clark County including Las Vegas, North Las Vegas, Henderson, Mesquite, and Boulder City. More than 7,000 people continue to move to Southern Nevada each month. Fourteen of the fifteen largest hotels in the nation are located on the world-famous “Las Vegas Strip,” which

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falls within Clark County's jurisdiction. The area's three top employment sectors are tourism, construction, and government.

In 1989, the U.S. Department of Energy (DOE) proposed building the nation's first and only high-level nuclear waste repository at Yucca Mountain, Nevada, an area 90 miles northwest of Clark County. While the DOE expressed a desire to avoid the transit of high-level nuclear waste through the highly urbanized areas Clark County, the numbers of rail and highway transportation routes through Nevada are limited, thus, access from the federal highway system and rail corridors, particularly from the eastern U.S. funnel through Clark County, Nevada. The DOE's proposed plan would bring 77,000 metric tons of radioactive wastes from the nation's 107 operating nuclear power plants as well as from federal weapons facilities by rail and truck through Clark County for permanent disposal at the repository. The DOE's proposed shipment campaign for these high-level radioactive wastes require the largest and most complex shipment campaign in our nation's history lasting thirty years or more. These radioactive wastes are proposed to be shipped across 43 states via public highways and rail. This proposal is met with steadfast opposition over the last two decades from state and local officials and area residents. This opposition is based on the notion that the risks outweigh any potential benefits that may be derived from the proposed repository.

The Board of County Commissioners for Clark County established oversight responsibilities in the Nuclear Waste Division of the Department of Comprehensive Planning and the Clark County's Yucca Mountain Nuclear Waste Advisory Committee. In particular, County Commissioners are concerned about the scientific and technical integrity of the project, and public health and safety. Evaluating potential socioeconomic impacts resulting from the repository is a key component of the County's efforts. Towards this end, Clark County has conducted numerous studies of potential impacts, many of which are summarized in Clark County's Impact Assessment Report that was submitted the DOE and the President of the United States in February 2002 (Clark County, 2002). Given the unprecedented magnitude and duration of the DOE's proposal, along with many unanswered questions about the number of shipments and mode of transport, i.e., rail and/or truck that will be used, the estimate of impacts described in these studies are preliminary.

In order to refine these estimates, Clark County Comprehensive Planning Department's Nuclear Waste Division is continuing to assess potential impacts. As part of this process, Clark County has implemented a Monitoring Program that tracks over 800 indicators that are designed to capture changes to the social, environmental, and economic well-being of its residents resulting from the Yucca Mountain Project and other significant events within the County. The Monitoring Program acts as an "*early warning system*" by providing information about changing trends among the indicators that may result from the Yucca Mountain Project. Through consistent monitoring of these indicators, Clark County decision makers can proactively respond to impacts from the Yucca Mountain Project.

Because of the dynamic nature of the Yucca Mountain Project, it is expected that the nature and timing of impacts to Clark County agencies will vary over the duration of the program. For example, the Clark County Fire Department has already spent considerable time in planning, training, and estimating impacts. Other Clark

County agencies likely will not experience any impacts prior to commencement of the High Level Nuclear Waste (HLNW) shipment campaign. During the past 18 months, the Monitoring Program has evolved significantly. While it remains a work in progress, the Monitoring Program has been refined and expanded to incorporate sub regional geographies within Clark County.

During 2004, the Clark County Board of Commissioners also commenced the Community Growth Initiative. The Initiative was intended to create a forum to discuss the benefits and challenges that come from being the fastest-growing community in the United States. As part of this process, Commissioners formed a Community Growth Task Force to study growth matters and engage in public debate. The task force was comprised of 14 private sector representatives, including members of business groups, developers, environmentalist and civic leaders. A draft of the Monitoring Program was introduced to the Task Force in January 2005. It was strongly embraced and many enhancements were requested. As part of its work product, the Task Force recommended that Clark County develop and maintain an expanded version of the Monitoring Program on a go-forward basis.

3.2 Overview of the System

The purpose of the monitoring system is to provide an “early warning” of changes within the social, economic, and/or environmental well-being of Clark County and its residents and is composed of the four components described below (Fig. 3.1). The core of the Monitoring Program is a set of over 800 economic, fiscal, social, environmental, and public health and safety indicators that are tracked on a monthly basis. While some of the indicators are specific to measuring the impacts from the Yucca Mountain proposal, others are more general and can be influenced by a variety of factors.

These indicators are then grouped into indices that provide a means for tracking various trends. The monitoring system and the other components described below, is maintained on a public web site (www.monitoringprogram.com) that can readily

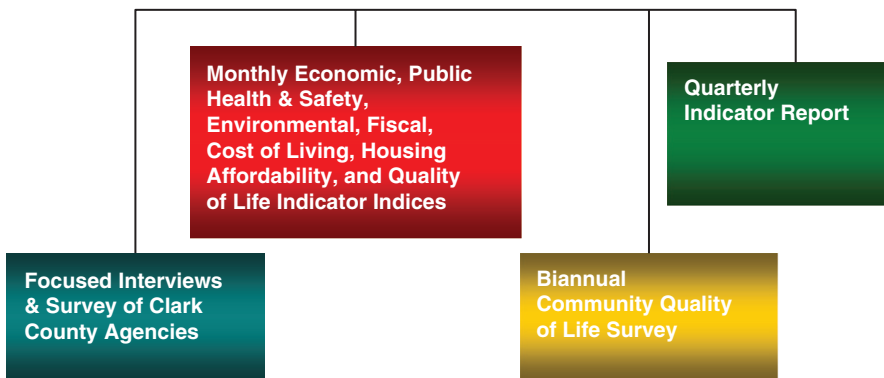


Fig. 3.1 Components of the monitoring system

be accessed by governmental decision makers and the public. The monthly indicators are quantitative outcome measures that demonstrate us how the community is changing over time. What they can not tell us is whether these changes are affecting the community's quality of life or the ability of both the public and private sector to respond to these changes. The three additional components of the monitoring program described below are designed to fill this gap.

These components include (1) annual focused interviews with local government decision makers; (2) a bi-annual survey of residents; and (3) quarterly indicator reports that summarize trends in lay terms for broad public use. In order to understand how effectively local government is responding to changes in the socio-economic, environmental, and quality of life trends and to changes in public perception, focused interviews are conducted on an annual basis with key local government decision makers. Those interviewed include department directors and line managers for key governmental services. These local experts are most familiar with their organization's function and the level of demand for services that they provide. These service providers can provide insight as to whether external changes in the community are resulting in changes in demand for their agencies service and whether any changes in demand are affecting the quantity and/or quality of the services that their agency provides.

Since a community's well being is linked not only to quantitative performance metrics but also the public perception of a variety of quality of life factors and their view of government performance, bi-annual surveys were implemented in 2005. The surveys provide the contextual framework for evaluating the quantitative trends documented in the month indicators that are tracked.

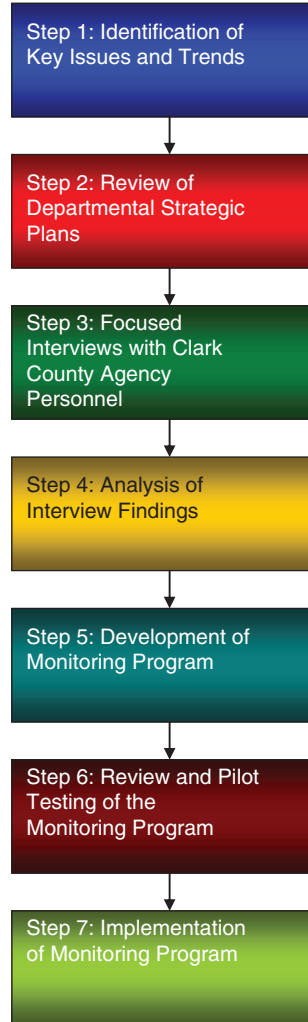
One of the challenges in implementing a monitoring program of this magnitude is how to integrate the data into useful information that can readily be understood by the public and decision makers. Towards this objective, a quarterly briefing document has been developed that synthesizes the data within each of the core assessment areas (i.e., economic, fiscal, social, environmental, public health and safety) into encapsulated trend summaries. The quarterly briefing document has been designed to be easily read and pertinent to a wide array of users.

When viewed together, the components of the monitoring program provide a comprehensive framework for assessing the impacts within Clark County from the Yucca Mountain Project and a broad array of other growth related impacts. Each component has been designed to leverage limited government resources available to monitor change in this rapidly growing dynamic community.

3.3 Research Design

The research design for the monitoring program was composed of five steps (Fig. 3.2). The first step was to identify key issues and trends in monitoring programs across the United States (Cobb & Rixford, 1998; Hammond, Rodenberg, Bryant, & Woodward, 1995; Hart, 1999; Meadows, 1998; Okubo, 2000; Pal, 1997).

Fig. 3.2 Research design



This included a literature review; a review of other secondary source data; as well as interviews with groups and individuals responsible for a diverse array of monitoring programs to identify best practices (Higgs & White, 2000; Innis, 1990; McClaren, 1996; Murtagh, 1996; Phillips, 2005).

During step two, strategic plans from all Clark County agencies were gathered, analyzed, and catalogued in a web-based database. As part of step three, interviews were conducted with Clark County agency personnel in order to identify existing indicators that were currently being tracked within their departments and to identify key indicators that should be monitored that could identify potential impacts from the Yucca Mountain Project along with other changes to the socio-economic, environmental, fiscal, public health and safety, and community well-being of Clark County residents.

The fourth step of the research was to evaluate the findings from the interviews in conjunction with national indicators. During this phase, thousands of indicators were evaluated.

The most complex task of selecting a comprehensive set of indicators that span the full range of local government services and then compiling these indicators into subject matter indices was the fifth step in the development of the Monitoring Program. As part of this process over fifty subject matter experts from the public and private sector and academia reviewed and commented on each index (Fig. 3.3). The research design utilized three separate approaches for evaluating each index. First, each index was reviewed by senior decision makers within every governmental agency in Clark County. These public decision makers are familiar with all of the indicators within their subject expertise and were able to provide a qualitative assessment of the accuracy of the index or indices within their field.

Second, each index was validated to a quantitative secondary source in order to calibrate fit and ensure accuracy. For example, the economic index was evaluated against the Southern Nevada Index of Leading Economic Indicators (SNILEI) which is produced by the University of Nevada Las Vegas (UNLV) on a monthly basis. The SNILEI allowed us to evaluate the accuracy of the weighting for each indicator within the index going back to 1970. In addition to the review and evaluation by local government subject matter experts and assessments against other independent secondary source data, the Community Growth Task Force reviewed and commented on each indicator and index. By triangulating the results of each of these evaluations, the final indicators and indices were developed. A specific discussion of the methodology for each index is discussed in more detail along with a description of each of the key indices by subject area later in this chapter.

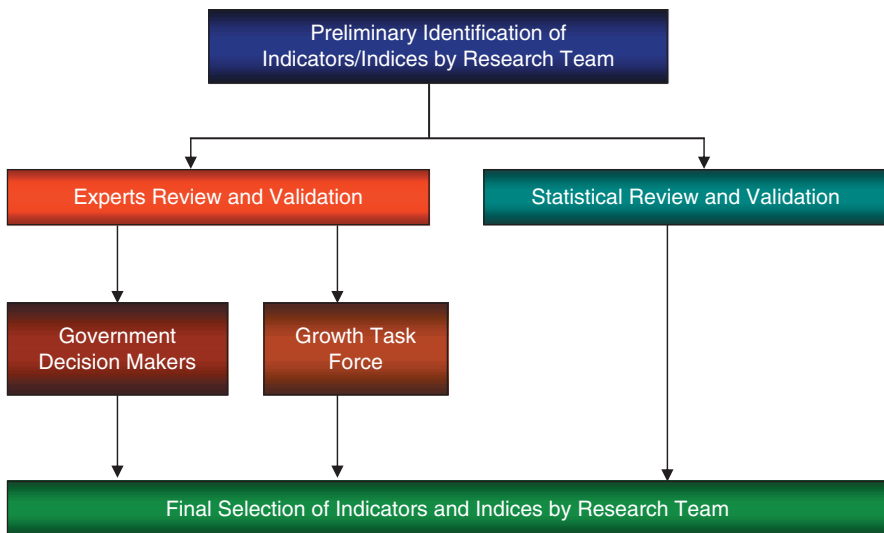
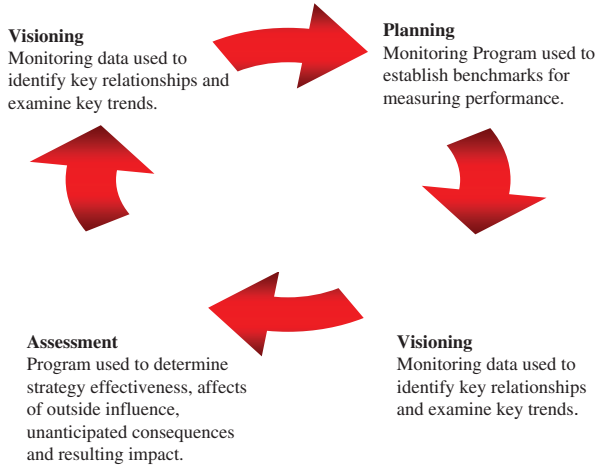


Fig. 3.3 Indicator and index review and selection process

Fig. 3.4 Monitoring program continuous review process



Once the indicators were selected and the indices compiled and reviewed, a web site was designed to allow easy access for review and comment by the same local government decision makers and the Community Growth Task Force that had been involved in the development of the Monitoring Program. Over the subsequent six month period, the Monitoring Program was pilot tested as a secure pass word protected site, while additional comments were received and incorporated. Finally, in December 2004, the Monitoring Program went live with open access to the public (Step 7). It should be noted that this is a dynamic, ongoing process (Fig. 3.4). In order to maintain the vitality and usefulness of the Monitoring Program each indicator and index is reviewed quarterly using the following approach. First, the monitoring data is routinely reviewed to identify key relationships and examine key trends. Second, the Monitoring Program is used to establish benchmarks for measuring performance both within governmental agencies and across the County as a whole. Third, the Monitoring Program is used to track benchmarks, track changes, and identify causalities. Finally, the Monitoring Program is used to determine strategy effectiveness, affects of outside influence, unanticipated consequences and their resulting impact.

3.4 Monitoring Program Indices

3.4.1 General Structural Elements

As noted in the previous sections of this chapter, the Monitoring Program is segmented into five primary sections: (1) economic, (2) environmental, (3) public health and safety, (4) social and (5) fiscal. The indicators contained in each of these sections can be viewed as analysis tools; and, in turn, www.monitoringprogram.com can



Fig. 3.5 Clark county monitoring program website homepage

be viewed as a tool box. The Internet-based information access point is designed simply, providing easy access to both the novice and advance user.

The site's homepage (Fig. 3.5) provides an access point to the majority of information analyzed on a recurring basis. Sidebar links (Fig. 3.5, Note 1) provide easy access to the each indicator series. A ticker (Fig. 3.5, Note 2) summarizes changes in many key variables on a real-time basis. In addition to being an interesting element of the site, the ticker itself plays an important purpose in that it provides updates of individual indicators before full indicator sets are updated and released.

The indicators worksheets are commonly structured (Fig. 3.6 provides an example). Each of the indices provide a trend line (Fig. 3.6, Note 1), which provides users a historical perspective and analysts the ability to benchmark and stress test the indicators ability to react to (or predict) changes in local conditions. The second common element on each page is the analysis summary table (Fig. 3.6, Note 2). Generally speaking, information is provided for the current period, the prior period and the same period of the prior year. Rate of changes are also reported, and, where appropriate individual indicators are weighted to allow reasonable contributions to an overall index value. This common weighting of indicators is necessary to ensure that variable that may have greater natural variability are not overshadowed by those with more subtle movements. The third common element is a text overview (Fig. 3.6, Note 3). The intent of this element is merely to inform users as to the analysts' understanding of present conditions and their expectation of future performance. Finally, the fourth common element is an archive reference (Fig. 3.6,

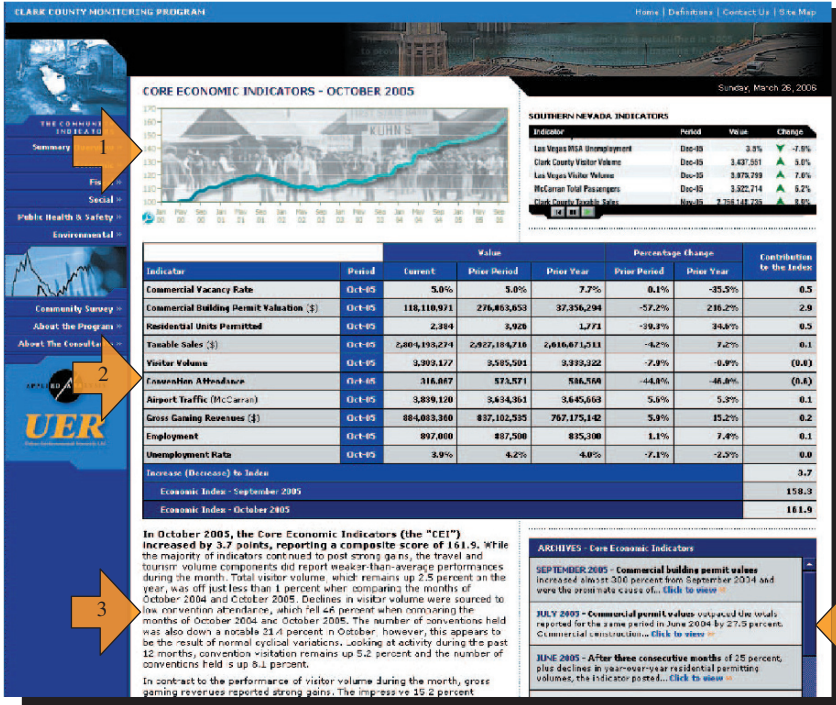


Fig. 3.6 Clark county monitoring program website sample indicator page

Note 4). This tool allows readers to go back to previous months, obtain datasets and compare performance analyses and expectations.

3.4.2 Other Structural Considerations

While there are several common structural elements to how each of the Monitoring Program's indices is reported, this should not be misinterpreted to suggest that all of the indices themselves are structurally similar. In fact, they tend to be very dissimilar in terms of timing, data availability, data structure, and analytical form. While this presents some analytical challenges, it is merely a practical reality of the imperfect nature of data. The goal of the monitoring program is to provide a common framework for analysis, not to provide a perfectly parallel time series. Individual indices are updates on a monthly, quarterly or annual basis, depending on the availability of information. This reporting timeline is not always regular. While many datasets have a normal release pattern (e.g., data are released on the 15th of every month) others are more sporadic in their timing.

Also important is the structure of the data itself. Recent updates to the Monitoring Program have sought to compare and contrast performance metrics among and

between local service providers, particularly as they relate to public safety services. A common example is emergency medical service (EMS) response times. Calculating response times requires a starting point and a stopping point, but which one of the following alternatives is most appropriate?

Starting point definitions:

1. The time a call requesting EMS service is received;
2. The time the emergency dispatch is notified by 9-1-1 about an emergency call;
3. The time the responding unit is notified about the emergency; or
4. The time the responding unit answers the emergency call (i.e. the time the responding unit starts moving).

Stopping point definitions:

1. The time a properly staffed and equipped responding unit arrives at the scene;
2. The time a properly staffed and equipped responding unit arrives at the patient's side;
3. The time a properly staffed and equipped responding unit leaves the scene; or
4. The time a properly staffed and equipped responding unit arrives with the patient at the destination or transfer point.

Unfortunately, all of these definitions can be appropriately used to calculate the response time of an EMS unit. Thus, analysis of these and other similar datasets require alternative forms of comparative study. The end result of this type of analysis is fairly straightforward. Simply put, analysts are concerned with whether or not conditions are getting better or worse. Irrespective of the definition of response times, moving from an average of seven minutes to eight minutes is generally considered problematic. While additional analyses might be required to better understand the proximately cause of the increase, the indicator's ability to raise a red flag (i.e., act as an early-warning system) is accomplished regardless of its operational properties. This is an admittedly imperfect solution; however, the pursuit of the perfect should not render the usefulness obsolete.

In addition to timing and reporting limitations, important differences in the way data are reported are also prevalent. Some data, such as concentrations of lower income housing, tend to be spatial in nature and have only ancillary relationships to time. Some data, such as tourist visitation and retail spending, are heavily seasonal in nature and require some degree of decomposition. Other data, including employment and population growth, tend to be cyclical and are heavily impacted by the recurring ebb and flow of the business cycle. Finally, some datasets, such as those relating to development activity, taxation or economic development, tend to be heavily impacted by policy initiatives. While no two indicator sets are exactly similar; the common denominator to each is the geography they are impacting. This results in a blurred line between causality and collinearity. A line that is becoming increasingly clear as datasets and the program's analytical techniques are further refined.

3.5 Primary Indicator Groups

In order to provide a comprehensive review of changes that are occurring within Clark County, fifty-three indices were developed that fall within five categories. These categories of indices include: economic, fiscal, social, public health and safety, and environmental as illustrated in Fig. 3.7. These indicator groups are briefly described below along with key indices.

ECONOMIC INDICES	SOCIAL INDICES	PUBLIC HEALTH & SAFETY INDICES
Agricultural Economy	Charitable Contribution	Crime Rate
Best Performing Cities	Parks & Recreation	Fire Safety
Core Economic	Dispersion	Health & Wellness
Cost of Doing Business	Federal Defense	Health Care Access & Availability
Cost of Living	Educational Attainment	Las Vegas Justice & District Court Filings
Development Activity	Educational Environment	Minority Child Wellness
Federal Spending	Family Services	Minority Mortality
Foreclosure	Homeownership Rate	Police Activity
Housing Price Appreciation	Household Income	ENVIRONMENTAL INDICES
Housing Supply Balance	Housing Affordability	Air Quality
Industrial Diversity	Low Income Threshold	Electricity Consumption
Occupational Wage	Minority Unemployment Disparity	Environmental Quality
Relative Cost of Living	Non-Profit Activity	Gasoline Consumption
FISCAL INDICES	Poverty Distribution	Gasoline Price
County Revenue Stability	Poverty Rate	Gasoline Supply
County Spending Pattern	Transportation System Congestion	Renewable Resource
Fiscal Performance		Residential Energy Consumption
		Total Energy Consumption
		Toxic Release Inventory
		Transportation Infrastructure
		Transportation System Utility
		Water Consumption

Fig. 3.7 Indices by indicator group category

3.5.1 Economic Indicators

3.5.1.1 Core Economic Index

The economic index is a composite of key performance measures designed to monitor the relative health of Southern Nevada’s economy. The index includes measures for construction and development activity, consumer spending behavior, tourism-related factors, and employment considerations. Each indicator is weighted based on its estimated impacts to the overall economic climate in an effort to provide a meaningful assessment. The economic index is reported on a recurring monthly

Indicator	Period	Value			Percentage Change		Contribution to the Index
		Current	Prior Period	Prior Year	Prior Period	Prior Year	
Commercial Vacancy Rate	Oct-05	5.00%	5.00%	7.70%	0.10%	-35.50%	0.5
Commercial Building Permit Valuation (\$)	Oct-05	118,110,971	276,063,653	37,356,294	-57.20%	216.20%	2.9
Residential Units Permitted	Oct-05	2,384	3,926	1,771	-39.30%	34.60%	0.5
Taxable Sales (\$)	Oct-05	2,804,193,274	2,927,184,716	2,616,671,511	-4.20%	7.20%	0.1
Visitor Volume	Oct-05	3,303,177	3,585,501	3,333,322	-7.90%	-0.90%	0
Convention Attendance	Oct-05	316,867	573,571	586,569	-44.80%	-46.00%	-0.6
Airport Traffic (McCarran)	Oct-05	3,839,120	3,634,361	3,645,663	5.60%	5.30%	0.1
Gross Gaming Revenues (\$)	Oct-05	884,083,360	837,102,535	767,175,142	5.90%	15.20%	0.2
Employment	Oct-05	897,000	887,500	835,300	1.10%	7.40%	0.1
Unemployment Rate	Oct-05	3.90%	4.20%	4.00%	-7.10%	-2.50%	0
Increase (Decrease) to Index							3.7
Economic Index - September 2005							158.3
Economic Index - October 2005							161.9

Fig. 3.8 Core economic indicator summary

basis. Some seasonal variability exists; however, the period-over-same-period-of-the-previous-year approach results in an apples-to-apples comparison framework.

The core economic index is summarized on Fig. 3.8. Changes in commercial occupancy rates can be an early indicator of a downturn in the business climate. While many factors including the normal economic cycle can lead to a downturn in commercial occupancy, there is the potential that stigma-related impacts from the proposed HLNW shipments may contribute or exacerbate downturns of this type. Similarly, changes in commercial building permit valuation, number of residential building permits, taxable sales, visitor volume, convention attendance, passenger counts, gross gaming revenues, employment, and unemployment rates can result from a variety of factors, including potential stigma-associated impacts resulting from HLNW shipments.

While monitoring these indicators will not directly provide a measure of impacts that may result from the Yucca Mountain Project, they will provide an early warning that change is occurring in the economic well-being of the community that warrants additional investigation. If stigma associated with Yucca Mountain HLNW shipments is found to be a causal factor, then they will help provide needed data to estimate the extent of impact.

3.5.1.2 Industrial Diversity Index

The industrial diversity index, illustrated on Fig. 3.9, uses industry-level employment data for the United States and Southern Nevada. Data are analyzed at the one-digit NAICS (North America Standard Industrial Classification) level, applying the Hachman Index. The Hachman Index is the inverse of the weighted sum of the location quotients, by industry, for a given county, across all industries (Hachman, 1994). A location quotient (LQ) for a given month is the fraction of the county's employment in a given industry divided by the fraction of the nation's employment in the same industry for the same month.

The LQs are weighted by the share of the county's employment in a given industry, for the given time period. Employment in a few key industries, which differ considerably from the fraction of employment for those industries nationwide, return relatively large weighted LQs and, consequently, a relatively low Hachman Index

	Employment			Location Quotient (1)		
	Current Period (Nov 2005)	Previous Period (Oct 2005)	Previous Year (Nov 2004)	Current Period (Nov 2005)	Previous Period (Oct 2005)	Previous Year (Nov 2004)
Natural Resources & Mining	400	400	400	9.3	9.3	10.5
Construction	106,500	107,200	94,300	214.7	214.2	209.1
Manufacturing	25,200	25,100	23,800	26.5	26.4	26.4
Utilities	3,300	3,300	3,300	86.1	86.1	92.4
Wholesale	22,100	22,100	20,800	57.8	57.9	58.2
Retail	98,200	95,200	94,800	94.9	94.1	97.6
Trans & Warehousing	29,300	29,400	27,700	99.9	100.2	102
Information	10,200	10,100	10,100	48.8	48.5	51.3
Financial Activities	51,300	51,000	47,100	93.2	92.7	92.7
Professional & Business Services	108,100	109,600	97,800	94.7	95.7	93.1
Education & Health Services	59,400	59,200	55,500	50.5	50.6	51
Leisure & Hospitality	267,100	267,000	249,800	321.4	316.4	322.9
Other Services	26,800	26,800	25,000	74.1	74.2	73.3
Government	90,900	90,600	87,400	61.3	61.5	62.8
Total/Average	898,800	897,000	837,800			
Index Value:				60.2	60.7	60.4
<p>Notes: (1) Location Quotient measures the local concentration of an industry in comparison to that industry's share of U.S. employment. A Location Quotient of 105, for example, indicates that the industry in question accounts for 5 percent more of the region's employment than does the same industry for all employment, nationwide. The index value is a mathematical formula that measures the average distance from the mean for each industrial sector. Higher scores indicate greater diversity; a perfectly diversified economy would return an index score of 100.</p>						

Fig. 3.9 Economic diversity indicator summary

value (since it is the inverse of the weighted LQs). Conversely, more closely reflecting the national employment distribution will have relatively small weighted LQs, and a relatively high Hachman Index value. Thus, a perfectly diversified economy would return an index value of 100.

Monitoring growth and concentrations in the region's workforce is also part of the broader analysis construct. There are, of course, many reasons why any particular industry might witness growth or decline. The introduction of HLNW facilities and shipments may have a number of potential affects, from creating construction, transportation, and government jobs to slowing growth in the leisure and hospitality industry as a result of reduced tourist vehicular traffic along shared transportation corridors. At the end of the day, an economy is largely defined by the segmentation of its workforce and its ability to maintain employment levels and create new industries. Understanding these movements, and identifying them as early as possible, allows impacted communities to capitalize on the positive benefits and insulate themselves from negative externalities.

3.5.1.3 Cost of Living and Relative Cost of Living Indices

As referenced to earlier, an analysis of potential impacts requires a broad analytical net. Analysts must be concerned not only with the primary impacting factors (e.g., the presence of a HLNW facility and related transports) but also the other considerations, local, regional or national, with the potential to create similar positive or negative affects. Cost of living is a particular area of concern in this regard, particularly for housing and health care and transportation.

The monitoring program relies on two sets of cost of living data. The first is purely the relative costs of six categories of purchases including housing, grocery items, utilities, transportation, health care and miscellaneous goods and services (Fig. 3.10). These data are collected and reported on a quarterly basis by ACCRA (American Chamber of Commerce Executives, 2006). The composite index measures relative price levels for consumer goods and services in participating areas municipalities across the United States. The average for all participating places, both metropolitan and non-metropolitan, equals 100, and each participant’s index is read as a percentage of the average for all places. Thus, during the third quarter of 2005, Fig. 3.10 indicates that the Las Vegas metropolitan area’s home prices were 135.9% of the national average.

Importantly, this index is not a measure of inflation (price change over time). Because each quarterly report is a separate comparison of prices at a single point in time, and because both the number and the mix of participants changes from one quarter to the next, index data from different quarters cannot be compared. Respecting this limitation, an upward trend such as that noted during the past three year is unambiguous (Fig. 3.11).

In addition to merely comparing changes in the relative cost of living, regional variations are also important. This is particularly the case where population in-migration is such an important element of the region’s economy. Nevada has been the fastest-growing state in America for nearly two decades, a period during which

Component	Value			Percent Change (vs.)	
	Current Period (Q3 2005)	Previous Period (Q2 2005)	One Year Ago (Q3 2004)	Prior Period	One Year Ago
Grocery Items	98.3	103.2	114.6	-4.80%	-16.60%
Housing	135.9	138.1	130.1	-1.60%	4.30%
Utilities	123.7	103.3	96.6	19.70%	21.90%
Transportation	109.3	110.1	107.8	-0.70%	1.40%
Health Care	106.4	107.4	120.5	-0.90%	-13.30%
Misc. Goods and Services	103.2	102.7	103.3	0.50%	-0.10%
Composite Index	114.8	113.9	113.3	0.80%	1.30%

(a) Note that the change in each component of the index will not total to the overall change in the index score due to variances in weightings of the components from period to period based on national cost averages.

Fig. 3.10 Cost of living indicator summary

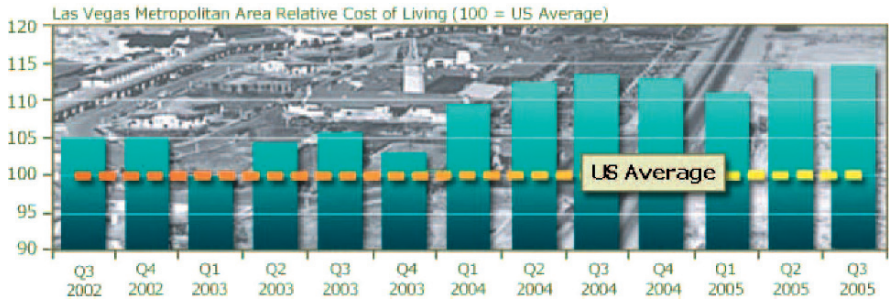


Fig. 3.11 Cost of living trend data

Indicator (1)	Cost of Living Index			Net Change	
	Current Period (Q2 2005)	Prior Period (Q1 2005)	Same Period Prior Year (Q2 2004)	Prior Period	Prior Year
Nevada (Las Vegas MSA)	114.8	113.9	113.3	0.9	1.5
Top In-Migration State Average	125.8	121.6	123.9	4.2	1.9
Top In-Migration State Average (barring CA)	109.1	108.9	110.9	0.2	-1.8
LV MSA Compared to Top In-Migration States	-11	-7.7	-10.6	-3.4	-0.4
LV MSA Compared to Top In-Migration States (barring CA)	5.7	5	2.4	0.7	3.3
Top 10 States of Origin (Share)					
California (35.0%)	144.1	136.3	144.3	7.8	-0.2
Arizona (4.9%)	101.7	101.5	103	0.2	-1.3
Florida (4.9%)	102.8	101	100.2	1.8	2.6
Illinois (4.3%)	94.8	96.1	100.1	-1.3	-5.3
Texas (4.0%)	89.2	89.4	89.3	-0.2	0
New York (4.3%)	134.5	129.9	124.5	4.6	10
Utah (3.2%)	92.8	93.5	94	-0.7	-1.2
Colorado (3.3%)	100	97.2	102.3	2.8	-2.3
Washington (2.9%)	104.3	108.8	104.2	-4.5	0.1
Hawaii (2.6%)	158.7	157.8	168.2	0.9	-9.5

(1) Nevada includes only the Las Vegas MSA as this is area of interest for this index. All other states reflect an average of the all reporting metropolitan areas

Fig. 3.12 Relative economic diversity indicator summary

Clark County’s share of the state’s total population increased from 58 to 71%. Combined with the fact that more than 30% of newcomers to the state are sourced to California, changes in the relative pricing between regions is of particular importance. A relative cost of living index is used to analyze these regional differences (Fig. 3.12). The same time and mix limitations exist with this more limited data set; however, the patterns of the data are also equally clear (Fig. 3.13).

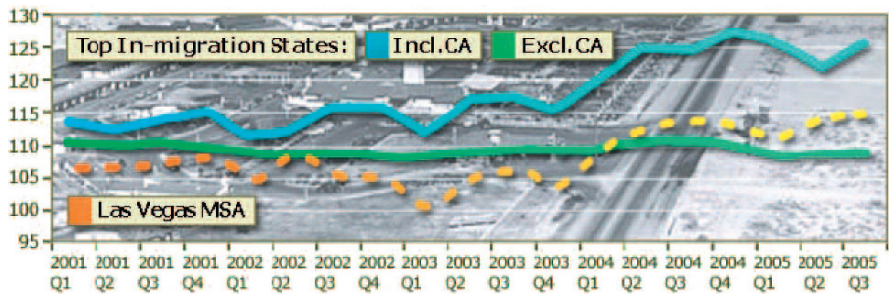


Fig. 3.13 Relative economic diversity trend

3.5.2 Environmental Indicators

3.5.2.1 Toxic Release Index

The Clark County toxic release index monitors harmful chemicals that are discharged into the environment. Specifically the TRI tracks the substances of concern as defined by the Environmental Protection Agency (EPA), and the Emergency Planning and Community Right-To-Know Act. Specifically the Clark County index measures pounds of chemicals released as a result of on-site, off-site or other releases each year (Fig. 3.14). Lower index values translate into fewer toxic releases, a condition generally construed as environmentally beneficial. The timing of these data does not lend themselves to serving as an early warning system. Moreover, in the event there is a significant discharge of toxic substances as the result of HLNW transportation or storage, it is likely that the warning will be immediate, national news coverage. Considering this, the timing of releases is of particular importance from an analysis standpoint.

3.5.2.2 Environmental Quality Index

The environmental indicators provide an early measure of changes to the community environmental well-being (Fig. 3.15). Clark County has shown its commitment to improving air quality and water quality through the many initiatives that it has undertaken and resources that it has provided to meet regulatory standards. The air quality indicators include “good days”, i.e., meets federal regulatory requirements, for carbon monoxide, ozone, particulate matter less than 10 and less than 2.5 microns. The water indicator measured is the number of gallons of treated water per day, per capita. Other indicators reflect the use of mass transit, the preservation of open spaces and the consumption of fossil fuels.

While many factors including growth rates and weather conditions can and will influence variables such as air and water quality, increased pollutants associated with HLNW shipments or an accident-related radiation release also could contribute to hindering the progress that Clark County has made in these areas.

3.5.3 Public Health and Safety Indicators

3.5.3.1 Fire Safety Indicators

Public health and safety indicators are generally those identified by the Clark County Fire Department, the Las Vegas Metropolitan Police Department, Clark County Health District, and University Medical Center as significant indicators that will provide decision makers with critical information needed to assess impacts from the Yucca Mountain Project. The fire safety index monitors seven core variables that reflect the County’s ability to respond to fire emergencies and resulting damage created by those emergencies (Fig. 3.16). Weighted annual growth rates are used to compute the overall change during each fiscal year. The index score was given a base value of 100 in 2000, the first year for which consistent data were available.

Total On -and-Off Site Disposals and Other Releases Chemical (lbs.)	2003	2002	Change
1,2,4-Trimethylbenzene	42	n.a.	n.a.
Aluminum (Fume Or Dust)	0	41	-100.00%
Ammonia	0	15,098	-100.00%
Arsenic	11,165	10,841	3.00%
Asbestos (Friable)	21,382	1,279	1571.80%
Barium	300,560	301,897	-0.40%
Barium Compounds	795,942	1,132,775	-29.70%
Benzene	3	n.a.	n.a.
Benzo (G,H,I) Perylene	1	1	-0.10%
Boron Trichloride	0	0	0
Carbonyl Sulfide	636	623	2.10%
Certain Glycol Ethers	0	n.a.	n.a.
Chlorine	934	992	-5.80%
Chromium	0	0	0
Chromium Compounds (Except Mined Chromite Ore)	27,942	28,138	-0.70%
Cobalt Compounds	6,760	37,399	-81.90%
Copper	190,372	214,553	-11.30%
Copper Compounds	18,591	27,443	-32.30%
Cyclohexane	16	n.a.	n.a.
Dibutyl Phthalate	0	0	0
Diisocyanates	11,754	0	n.a.
Dioxin And Dioxin-Like Compounds	0.01	0.01	0.20%
Ethylbenzene	42	39	7.70%
Ethylene Glycol	0	n.a.	n.a.
Hydrochloric Acid (1995 And After 'Acid Aerosols' Only)	163,313	112,978	44.60%
Hydrogen Fluoride	313,852	250,459	25.30%
Lead	116,448	116,932	-0.40%
Lead Compounds	236,930	243,612	-2.70%
Manganese	67,034	78,558	-14.70%
Manganese Compounds	525,636	1,696,338	-69.00%
Mercury	189	255	-25.90%
Mercury Compounds	424	399	6.20%
Methanol	3,251	4,350	-25.30%
Methyl Isobutyl Ketone	0	0	0
Molybdenum Trioxide	8,447	54,968	84.60%
N Hexane	33	n.a.	n.a.
Nickel	19,414	19,947	2.70%
Nickel Compounds	18,491	39,894	53.60%
Nitrate Compounds	0	0	0
Nitric Acid	0	0	0
Nitroglycerin	0	0	0
Phosphorus (Yellow Or White)	0	0	0
Polycyclic Aromatic Compounds	150	140	6.60%
Selenium	13,919	12,739	9.30%
Styrene	68,888	61,506	12.00%
Sulfuric Acid (1994 And After Acid Aerosols Only)	117,653	121,842	3.40%
Titanium Tetrachloride	4,309	4,320	0.30%
Toluene	4,953	5,500	9.90%
Vanadium Compounds	107,063	127,586	16.10%
Xylene (Mixed Isomers)	118	0	n.a.
Zinc (Fume Or Dust)	70,671	71,198	0.70%
Zinc Compounds	21,732	39,321	44.70%
Total	3,269,060	4,859,232	1,590,172

Fig. 3.14 Toxic release index

Indicator	Period	Value			Percentage Change		Contribution
		Current	Prior Period	Prior Year	Prior Period	Prior Year	
Air Quality (CO Days > Good)	Jul-04	16	16	17	0.00%	0.00%	0.04
Air Quality (Ozone Days > Good)	Jul-04	95	98	106	-3.10%	-10.40%	0.07
Air Quality (PM 10 Days > Good)	Jul-04	159	167	177	-4.80%	-10.20%	0.07
Air Quality (PM 2.5 Days > Good)	Jul-04	88	77	63	14.30%	39.70%	-0.27
Water Treated (Gal.) per Day / Capita	Jul-04	55.6	55.3	56.2	0.50%	-1.10%	0.01
Population Per Square Mile	Jul-04	3,260.60	3,249.40	3,134.90	0.30%	4.00%	0.04
Mass Transit Ridership per Capita	Jul-04	2.5	2.6	2.5	-1.30%	0.80%	0.01
Gasoline Consumption (Gal. per Capita)	Jul-04	38.1	35.7	37.8	6.60%	0.80%	-0.01
Lane Miles per 1,000 Population	Jul-04	3.1	3.1	3.1	-0.30%	-0.60%	-0.01
Parks (Acres) per 1,000 Population	Jul-04	1.3	1.3	1.3	0.20%	0.50%	0.01
Increase (Decrease) to Index							-0.04
Environmental Index - June 2004							108.19
Environmental Index - July 2004							108.15

Fig. 3.15 Environmental quality indicator summary

Indicator	Current Year - 2004	Year Prior - 2003	Percent Change	Index Value Change
Average Response Time	6:38	6:15	6.10%	-1.60%
Total Authorized Positions per 1,000 Population	0.97	1.01	-4.00%	-0.40%
Emergency Personnel per 1,000 Population	0.82	0.86	-4.70%	-0.70%
Fires per 100,000 Population	411	506	-18.70%	2.80%
Deaths per 100,000 Population	1.27	1.41	-10.20%	1.50%
Injuries per 100,000 Population	9.88	13.51	-26.90%	4.00%
Millions of Dollar Impact per 100,000 Population	\$2.84	\$4.75	-40.20%	2.00%
Total				7.70%
Index Value - 2003				82.36
Index Value - 2004				88.69

Fig. 3.16 Fire safety indicator summary

Scores that are above 100 indicate that there has been progress in fire emergency readiness and/or there has been a reduction in the damage incurred. Scores below 100 indicate a decreased degree of readiness and/or an increase in overall fire damage.

Data encompassed in the index include average response time (defined as the time it takes for the first responders to be on the scene of an emergency situation), total authorized positions per 1,000 population, emergency personnel per 1,000 population, fires per 100,000 population, deaths per 100,000 population due to fire, injuries per 100,000 population due to fire, millions of dollar impact per 100,000 population. Interviews with fire department personnel reflect multi-dimensional impact concerns. These range from the ability to operate an emergency operations center to reduced capacity to respond to common emergencies (e.g., house fires) due to resource reallocations in favor of nuclear incident preparedness. A refinement of these indicators will be required to better assess these impact as will integration with other fiscal and economic indices. Additionally, existing information does a relatively poor job of assessing rural area impacts. Information on this important segment is being developed.

3.5.3.2 Police Activity Index

Generally speaking, police responders share a similar set of concerns with those noted among fire services providers. Issues regarding the ability to respond to the

Incident Rates (per 100,000 population)	2004	2003	% Change
Accidents	2,926.60	2,351.80	24.40%
Hit and Run	687.4	552	24.50%
Accident w/Injuries	1,107.00	927.9	19.30%
Accident (Private Property)	264.8	220.4	20.10%
Fire	118.3	117.7	0.50%
Provler	156.9	163.4	-4.00%
Unknown Problem	1,153.70	983.1	17.40%
911 Disconnect	4,810.60	5,021.50	-4.20%
Suicide	15.1	14.5	4.30%
Attempted Suicide	476	460.6	3.40%
Burglary	1,570.60	1,518.10	3.50%
Burglary Alarm	1,946.90	1,895.10	2.70%
Vehicle Burglary	1,013.00	964.5	5.00%
Attempted Burglary	113.5	104.7	8.40%
Robbery	351.7	371.2	-5.30%
Robbery Alarm	352.2	336.4	4.70%
Attempted Robbery	44	46.1	-4.40%
Drunk	72.8	76.8	-5.10%
Drunk Driver	1,021.00	924	10.50%
Reckless Driver	1,097.40	976.7	12.40%

Fig. 3.17 Selected elements from the police activity index

increasingly number and diverse nature of emergencies, combined with resource limitations, make preparing for and facing threats imposed by HLNW shipments particularly ominous. Incidents in which Las Vegas Metropolitan Police Department officers are involved are routinely reported by the Department’s crime analysts. They are then compiled into the Clark County Police Activity index (Figs. 3.17 and 3.18). The index includes both crimes (e.g., robbery) and incidents (e.g., found persons) requiring police response. These data are then divided by the resident population (divided by 100,000) to monitor the rate of these incidents, per capita, over time. Higher rates indicate increased incidence and may reflect greater work loads. By contrast, lower rates reflect fewer events per capita. During 2004, the number of incidents responded to by the Las Vegas Metropolitan Police Department increased 6.8% to 61,000 incidents per 100,000 residents. This only compounds a trend in which the chances of becoming a victim of crime in Southern Nevada are significantly higher than those reported nationally.

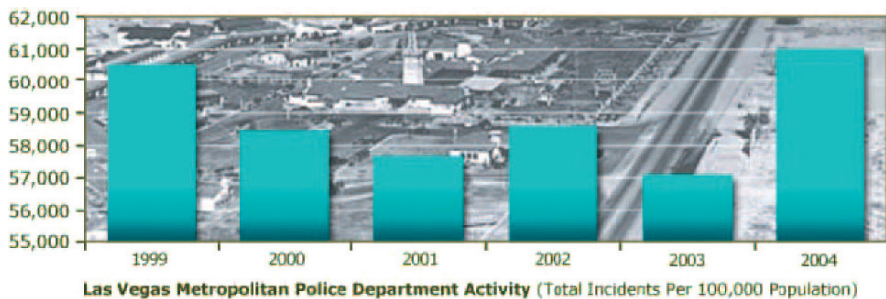


Fig. 3.18 Police activity index trend analysis

3.5.4 Social Indices

3.5.4.1 Dispersion/Concentration Indicators

This series of indicators measures the concentration of the socio-economic variables among small area geographies in Southern Nevada. For each variable a coefficient of variance is calculated. The coefficient of variance is a dimensionless measure of relative variability, designed to allow comparisons of variation for samples with different average sizes. It is calculated as the ratio of the standard deviation to the mean multiplied by 100. High scores suggest that groups are highly concentrated in few small area geographies while largely absent in others. By comparison low scores indicate a somewhat consistent distribution among the region. The examples provided in Fig. 3.19 provide some examples of the spatial analysis resulting from this effort and the table provided on Fig. 3.20 summarized the coefficients calculated for dwelling unit dispersions.

Stigma associated with transporting HLNW could have any number of affects on Southern Nevada’s socio-economic landscape. It could reduce the rate of retiree immigration, make areas further away from transportation routes more desirable (and thus accessible to more affluent individuals) or reduce the level of service sector investment. Any stigma-related downturn, in property values for example, would indirectly affect the services that Clark County provides that may result in increases

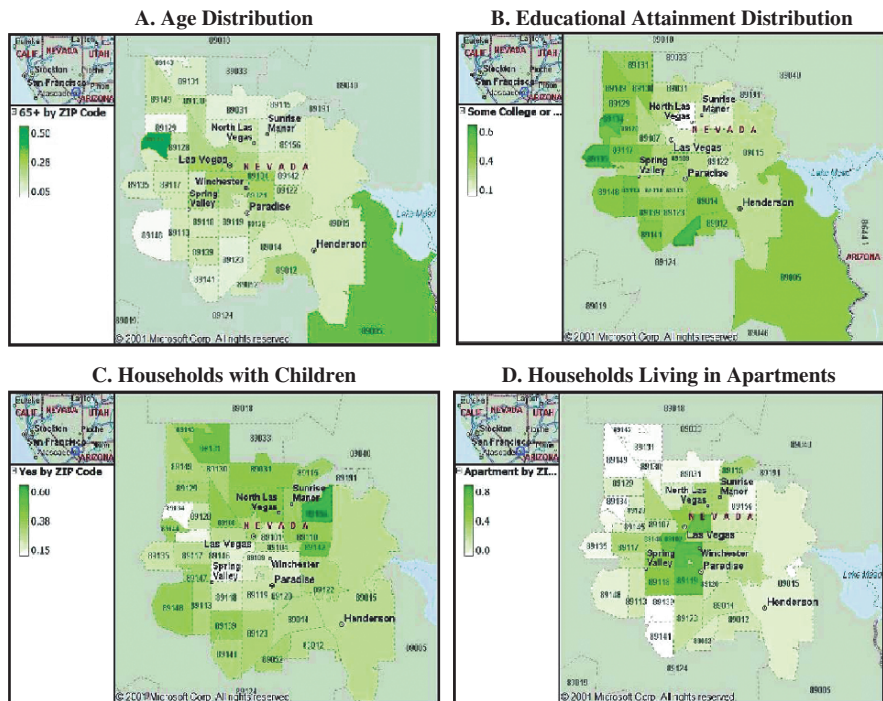


Fig. 3.19 Selected dispersion indicator summary maps

Unit*	1999	2000	2001	2002	2003	2004
Single Family	0.37	0.4	0.39	0.38	0.38	0.38
Apartment	0.78	0.77	0.76	0.83	0.81	0.82
Condo/Townhouse	0.78	0.8	0.77	0.78	0.72	0.76
Mobile Home	1.56	1.74	1.71	1.78	1.73	1.8
Index Value	0.87	0.92	0.91	0.94	0.91	0.94

*Coefficient of Variation Analysis, Higher No. Equals Greater Cohort Concentrations

Fig. 3.20 Dwelling unit dispersion index summary

to the poverty rate and less dollars per pupil for education. Monitoring of these indicators will provide insight for decision makers about the nature and extent of the community’s response to DOE’s proposed Yucca Mountain Project.

3.5.4.2 Housing Affordability Index

The housing affordability index monitors nine core variables that reflect the availability and affordability of housing in Southern Nevada (Fig. 3.21). Weighted annual growth rates are used to compute quarterly changes to the index. Index scores above 100 indicate housing is becoming attainable to a larger share of the population. Scores below 100 indicate that housing is becoming increasingly out of reach for a greater share of the population. The index is set at 100 in the year 2000.

A primary area of analysis relates to impacts of HLNW shipments on property development and property values. Pricing fundamentals within the market play an extremely important role in evaluating trends. Additionally, subregional analysis of referenced pricing dynamics, such as land prices (Fig. 3.22), will allow analysts to better analyze whether proximity to primary HLNW routes are resulting in more significant impacts.

	2000	2001	2002	2003	2004
Ratio of New Home Price to Median Household Income	\$3.63	\$3.85	\$4.18	\$4.28	\$4.98
Ratio of Existing Home Price to Median Household Income	\$3.03	\$3.14	\$3.41	\$3.59	\$4.72
Cost of Living Index - Housing	91.1	87.2	92.9	98.6	125.5
Single Family To Multi-family Units Permitted Ratio	3.41	2.48	2.49	2.69	6.25
Households with Income Less Than 80% of the Median	41.2	42.8	38.3	40.02	42.63
Households with Income Less Than 60% of the Median	28.42	28.25	26.02	27.44	27.76
Average Price of Land In Clark County (\$ per Acre)	\$143,118	\$158,126	\$158,731	\$201,919	\$325,987
Construction Cost Index	125.8	127.8	131.9	133.8	137.1
Household Income Required to Rent a Median Apartment*	65.30%	65.30%	67.20%	63.20%	63.90%
Index Value	100	99.3	97.7	93.5	72

Fig. 3.21 Housing affordability index summary

3.5.5 Fiscal Indicators

3.5.5.1 Fiscal Performance Index

The fiscal performance index is a composite of key performance measures designed to monitor the relative performance of the Clark County fiscal system (Fig. 3.23). The index includes measures likely to impact the various significant revenue sources

	City of Henderson	City of Las Vegas	City of North Las Vegas	Unincorporated Clark County	Valley-wide Total
Quarter Ended December 31, 2004					
Number of Land Sales Transactions	32	51	39	188	310
Number of Acres Sold	156	153	407	1,102	1,817
Average Sales Price per Acre	\$477,452	\$379,893	\$390,743	\$593,899	\$520,448
Average Sales Price per Square Foot	\$10.97	\$8.72	\$8.97	\$13.63	\$11.95
Median Sales Price per Acre	\$434,146	\$356,796	\$348,480	\$424,525	\$400,000
Median Sales Price per Square Foot	\$9.97	\$8.19	\$8.00	\$9.75	\$9.16
Quarter Ended September 30, 2005					
Number of Land Sales Transactions	50	49	27	236	362
Number of Acres Sold	138	164	265	1,233	1,805
Average Sales Price per Acre	\$574,830	\$815,876	\$450,079	\$763,752	\$738,014
Average Sales Price per Square Foot	\$13.20	\$18.73	\$10.33	\$17.53	\$16.25
Median Sales Price per Acre	\$468,486	\$662,651	\$459,816	\$560,000	\$533,384
Median Sales Price per Square Foot	\$10.75	\$15.21	\$10.56	\$12.86	\$12.24
Quarter Ended December 31, 2005					
Number of Land Sales Transactions	31	34	34	219	318
Number of Acres Sold	90	103	3,229	1,072	4,494
Average Sales Price per Acre	\$550,051	\$766,987	\$280,918	\$613,003	\$376,167
Average Sales Price per Square Foot	\$12.63	\$17.15	\$4.45	\$14.07	\$8.44
Median Sales Price per Acre	\$453,731	\$615,293	\$482,721	\$525,600	\$497,727
Median Sales Price per Square Foot	\$10.42	\$11.83	\$11.08	\$12.07	\$11.43
Percentage Change from Preceding Quarter					
Number of Land Sales Transactions	-36%	-31%	26%	-7%	-12%
Number of Acres Sold	-35%	-37%	1118%	-13%	14%
Average Sales Price	-4%	-8%	-38%	-20%	-47%
Median Sales Price	-3%	-22%	5%	-6%	-7%
Percentage Change from Prior Year Quarter					
Number of Land Sales Transactions	-3%	-33%	-13%	16%	3%
Number of Acres Sold	-42%	-33%	694%	-3%	147%
Average Sales Price	15%	97%	-28%	3%	-28%
Median Sales Price	5%	44%	39%	24%	24%

Fig. 3.22 Land pricing trend analysis, by jurisdiction

Indicator	Period	Value			Percentage Change		Contribution
		Current (Sep 2005)	Prior Period (Aug 2005)	Prior Year (Sep 2004)	Prior Period	Prior Year	
Median Existing Home Value	Sep-05	\$285,000	\$282,000	\$250,000	1.10%	14.00%	0.14
Median New Home Value	Sep-05	\$327,276	\$321,550	\$278,924	1.80%	17.30%	0.17
Com. Construction Permit Valuation	Sep-05	\$276,063,653	\$86,814,284	\$69,963,361	218.00%	294.60%	2.92
Number of Existing Home Sales	Sep-05	5,179	5,786	5,079	-10.50%	2.00%	-
Number of New Home Sales	Sep-05	2,978	2,975	2,388	0.10%	24.70%	0.04
Electric Meter Counts	Sep-05	675,589	672,472	643,533	0.50%	5.00%	0.03
Taxable Retail Sales - All Activity	Sep-05	\$2,927,184,716	\$2,821,263,102	\$2,687,553,644	3.80%	8.90%	0.75
Taxable Auto Sales	Sep-05	\$385,555,687	\$424,678,368	\$401,631,484	-9.20%	-4.00%	(0.05)
Number of Cigarette Sales (in Packs)	Sep-05	14,230,200	14,961,600	12,398,400	-4.90%	14.80%	0.03
Gallons of Liquor Sales	Sep-05	6,981,014	7,982,948	7,107,378	-12.60%	-1.80%	-
Employment	Sep-05	887,500	877,300	827,100	1.20%	7.30%	0.02
Room Nights Occupied	Sep-05	3,539,120	3,663,247	3,512,865	-3.40%	0.70%	-
Average Daily Rate (ADR) per Room	Sep-05	\$108	\$93	\$90	15.50%	19.00%	0.06
Number of Slot Machines	Sep-05	131,044	132,044	130,317	-0.80%	0.60%	-
Number of Gaming Tables	Sep-05	5,089	5,059	4,762	0.60%	6.90%	-
Increase (Decrease) to Index							4.12
Fiscal Index - August 2005							180.05
Fiscal Index - September 2005							184.17

Fig. 3.23 Fiscal performance index summary

of the County, including, property values (ad valorem tax revenues), number of real property transaction (property transfer tax), utility connections (franchise fees), sales activity (taxable retail sales), automobile sales (automobile privilege tax), cigarette and alcohol sales (cigarette and alcohol taxes), employment (business license fees), hotel room revenues (room tax collections), and the number of gaming devices (gaming license fees). Each indicator is weighted based on its estimated impacts to the overall fiscal structure in an effort to provide a meaningful assessment. The indicator is produced monthly.

A government’s ability to produce revenue is fundamental to its ability to provide necessary public services. The transportation of HLNW could have any number of affects on local government tax collections, from stigma-related declines in taxable property values to declines in tourist visitation impacting gaming, lodging and sales tax collections. The fiscal performance index is specifically designed to provide early-warning tracking not only of tax collections but of the underlying variables giving rise to those collections.

3.5.5.2 County Spending Pattern Index

The county spending pattern index monitors changes in how general county services are funded over time (Fig. 3.24), based on data reported annually in the Clark County Comprehensive Annual Financial Report. Expenditures by function are inflation-adjusted to 1999 dollar values for comparison purposes. The United States’

	1999	2000	2001	2002	2003	2004
General Government Spending	TOTAL VALUE (in millions - except per capita estimates)					
General government	\$103	\$113	\$120	\$286	\$320	\$346
Judicial	\$80	\$92	\$99	\$107	\$117	\$123
Public safety	\$377	\$437	\$482	\$653	\$733	\$777
Public works	\$157	\$153	\$167	\$156	\$368	\$230
Health	\$15	\$17	\$20	\$23	\$25	\$28
Welfare	\$54	\$59	\$60	\$80	\$98	\$95
Culture and recreation	\$20	\$19	\$23	\$21	\$29	\$31
Other	\$35	\$40	\$55	\$51	\$53	\$55
Total General Government Spending	\$841	\$930	\$1,025	\$1,377	\$1,744	\$1,684
Per Capita General Government Spending	\$643	\$688	\$718	\$869	\$1,062	\$964
Government Enterprise Spending	TOTAL VALUE (in millions - except per capita estimates)					
University Medical Center	-	-	-	\$409	\$428	\$458
Water Reclamation District	-	-	-	\$57	\$66	\$72
Las Vegas Valley Water Authority	-	-	-	\$273	\$295	\$332
Department of Aviation	-	-	-	\$175	\$188	\$188
Other Enterprise Funds	-	-	-	\$143	\$146	\$160
Internal Services	-	-	-	\$96	\$104	\$102
Total Government Enterprise Spending	\$839	\$928	\$1,029	\$1,152	\$1,226	\$1,312
Per Capita Government Enterprise Spending	\$642	\$686	\$721	\$727	\$747	\$751
Total General and Enterprise Government Spending	\$1,680	\$1,858	\$2,055	\$2,529	\$2,970	\$2,96
	1999	2000	2001	2002	2003	2004
General Government Spending	INFLATION ADJUSTED PER CAPITA ESTIMATES					
General government	\$79	\$81	\$78	\$165	\$175	\$173
Judicial	\$61	\$66	\$65	\$62	\$64	\$62
Public safety	\$288	\$312	\$315	\$377	\$400	\$389
Public works	\$120	\$109	\$109	\$90	\$201	\$115
Health	\$12	\$12	\$13	\$14	\$14	\$14
Welfare	\$42	\$42	\$39	\$46	\$54	\$47
Culture and recreation	\$15	\$13	\$15	\$12	\$16	\$15
Other	\$27	\$29	\$36	\$29	\$29	\$27
Per Capita Government Spending	\$643	\$665	\$669	\$795	\$951	\$844
Government Enterprise Spending	INFLATION ADJUSTED PER CAPITA ESTIMATES					
University Medical Center	-	-	-	\$236	\$233	\$229
Water Reclamation District	-	-	-	\$33	\$36	\$36
Las Vegas Valley Water Authority	-	-	-	\$158	\$161	\$167
Department of Aviation	-	-	-	\$101	\$102	\$94
Other Enterprise Funds	-	-	-	\$82	\$80	\$80
Internal Services	-	-	-	\$55	\$57	\$51
Total Government Enterprise Spending	\$642	\$663	\$672	\$665	\$669	\$657
Total General and Enterprise Government Spending	\$1,284	\$1,328	\$1,340	\$1,460	\$1,620	\$1,501

Fig. 3.24 Fiscal performance index summary

Bureau of Labor Statistics Consumer Price Index for all Western Urban Consumers (the CPI-UW) is used to calculate the rate of inflation. Per capita estimates rely on annual, county-wide population data published by the University of Nevada Las Vegas Center for Business and Economic Research. Since this series is dependent on annual financial reports, it is released annually.

As noted throughout this section, analysts and decision makers need to be concerned with both the direct and indirect impacts of HLNW storage and transportation. It is quite clear how public safety agencies, such as police and fire protection, might be impacted. It is a bit more difficult to identify the nexus to child welfare programs, homelessness, flood protection or crime enforcement. In absence of substantial mitigating funds, it is likely that Nevada's state and local governments will be required to shift resources away from existing programs and into efforts aimed at ensuring threats, patent and latent, sourced to storage and transportation of high-level nuclear waste are addressed. Such a shift away from existing public services would inherently reduce the quality of life with the community, and may potentially have far-reaching economic, fiscal and social implications. Thus, monitoring how governments spend their money is considered a fundamental element of the program.

3.6 Other Monitoring Activities

As noted in the overview section, the Monitoring Program is comprised both of the regularly tracked indicators described above and annual focused interviews with local government personnel, bi-annual surveys of the general public and quarterly indicator briefs. These are described in detail below.

3.6.1 Focused Interviews with Clark County Agencies

The primary purpose for developing the Monitoring Program is to assess impacts that may result from shipments of high-level nuclear waste through Clark County over several decades. As part of Clark County Department of Comprehensive Planning's Nuclear Waste Division ongoing effort to refine the estimate of potential impacts from the Yucca Mountain Project, the research team continues to conduct annual interviews with all key departmental directors and staff.

The focused interviews for the 2005 update to the Community Impact Report incorporated several refinements to earlier methodologies (Urban Environmental Research, 2005). First, the survey instrument incorporated new needs assessment guidance from the Office of Domestic Preparedness within the Department of Homeland Security (USDHS/ODP, 2003). This is important because the Office of Domestic Preparedness is the lead federal agency for working with local public safety entities to prepare and respond to events involving chemical, biological, and radiological materials. Second, a concerted effort was made to identify and

eliminate redundancies in the needs assessment for public safety personnel, equipment and facilities across jurisdictions. Since the terrorist events of September 11, 2001, federal, state, and local public safety personnel have focused on improving emergency response through enhanced coordination and leveraging resources across jurisdictions. Third, a life-cycle fiscal model was developed that provides local decision makers not just the costs associated with preparing for shipments but also the life cycle personnel, training, construction, operations, and maintenance costs over the approximate three and a half decades of proposed high-level nuclear waste shipments.

The updated assessment of the public health and safety impacts associated with various high-level nuclear waste transportation scenario particularly helped in refining differences among local public safety providers and synthesizing each provider's nexus to impact assessment.

Interviews with department-level staff highlighted additional impact areas, improved technology increased information access and added awareness regarding the informational benefits of the Program helped researchers identify and mine new datasets. These factors contributed to an expansion of the amount of information tracked by the Program by roughly 32% during 2005.

3.6.2 Bi-annual Survey

Changes to the economic landscape, fiscal system performance and the social environment are ever-present. Without a consistent historical basis, it would be difficult, if not impossible, to assess how a change in policy or an exogenous factor impacted the economy. The quantitative, statistics-based indicator research provides this baseline for performance measurement. It reviews and analyzes hundreds of statistics on economic performance (e.g., employment growth, unemployment and housing starts); fiscal performance (e.g., property tax collections and justice system costs); public health and safety (e.g., the crime rate, fire safety response times and police officers per 1,000); and social condition (e.g., income growth, poverty and welfare caseloads). While extensive in its reach, this construct lacked a key dimension. It would reflect, for example, if more police officers are put on the streets, but not if people are feeling safer in their homes. It would reflect whether housing prices are above or below national averages, but not if citizens believe homeownership is an attainable goal. It would reflect whether the community was constructing additional lane miles of roads, but not if citizens were finding it easier to get from home to work each day. Only through a survey of community sentiment could these important impact-assessment questions be integrated into the broader construct. The Program was expanded in the summer of 2005 to include a broad-based bi-annual community survey as a complement to its statistical baseline (Fig. 3.25).

In addition to the broad assessments outlined above, the survey also includes targeted issues tracking specific to the existence of the Yucca Mountain Nuclear Waste Repository. As that project moves forward through licensing, or as the federal government releases additional details about transportation plans for transporting

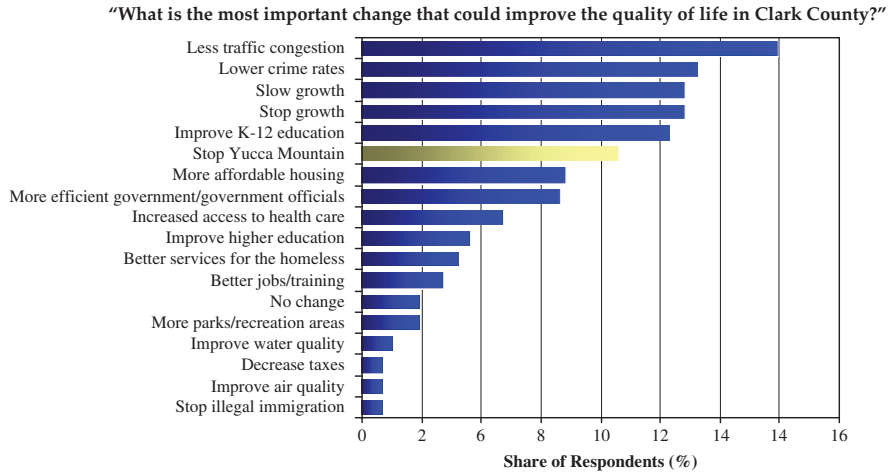


Fig. 3.25 Community survey response distribution

waste, the survey will help elected officials in the community better assess whether residents are becoming increasingly concerned about the repository or adapting to its presence without issue. Consider, for example, that when residents were asked, “What is the most important change that could improve the quality of life in Clark County?”, one out of every eleven respondents cited “Stop Yucca Mountain.” This factor may or may not change when high-level nuclear waste shipments begin being transported through the Las Vegas Valley. Over time, however, a comparison of qualitative and quantitative indicators can be utilized to segment community impacts associated with the repository’s presence from those consistent with existing trends or with distinct causal relationships.

3.6.3 Community Integration

Community wide integration was the theme of 2005. What started as a series of independent efforts has become a community cooperative. All of Clark County’s cities are or will be contributing to the effort. While regional data are being requested, analyzed and disseminated on a routine basis, on-going meetings with staff representatives at local government entities are continuing. These meetings are already being translated into comparative analyses and specific programs that can be easily integrated with locally-based information tracking efforts; and, by the close of 2006, these data should be uniformly housed, tracked, analyzed and reported under the Program.

Sub-regional integration is no trivial pursuit. Whether a variable (e.g., multi-family units permitted) is region or local in nature, it may quite unique significance to any particular jurisdiction (e.g., what is classified and multi-family, is the sub-region dealing with an affordable housing problem). These differences raise

important political and technical issues that need to be addressed to ensure the validity of comparative statistics or assessments. To be effective both qualitative and quantitative assessments must be uniform.

A variable-by-variable assessment is foundational here; although, the indicator survey data discussed above also provided unique and helpful insights into the relevance of certain variables to the public and the extent to which local governments effectively meeting their concerns. Putting more police on the streets in one area, for example, may concurrently decrease crime in one region while increasing it in another. The importance of police service to populations in each region, however, will impact how the regional quality of life is impacted. While more complicated in practice, this analogy can easily be extended to high-level nuclear transportation accident occurring in one region versus another. Figure 3.26, below, provides a significantly over-simplified summary of the sub-regional viable integration process.

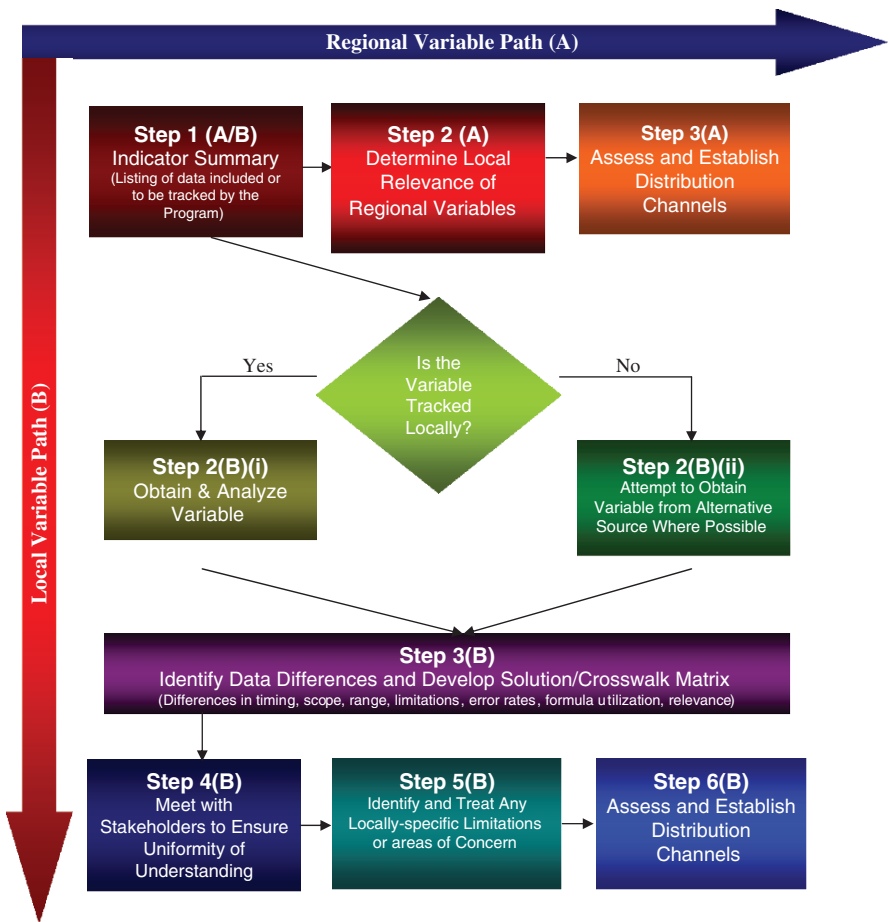


Fig. 3.26 Regional and local variable integration

3.6.4 Quarterly Indicator Reports

Broader information dissemination also became important during 2005 as the number of Program users and functions began to increase. Policy changes are complex; and as such, it would be terribly naive to attribute any particular change in a policy decision or local action to the mere presence of the Program. This having been said, the information compiled and reported as part of the Program has been present in a number of recent policy discussions and is in the process of being integrated into several additional government functions. These include, without limitation, improvements to the County's Nuclear Waste Program, Clark County's performance measurement initiative, increased awareness regarding spikes in child protective services caseloads, integrated transportation planning models and affordable housing challenges. Data produced by the Program has been used to analyze fire response time challenges in and around the central business district and to identify economic diversification patterns.

Two additional documents were generated to assist in increasing the communication efficiency of the Program: (1) the publication of a quarterly briefing document and (2) the routine issuance of quarterly indicator briefs. There was simply too much information routinely generated by the Program to be usefully assimilated. The quarterly briefing document attempts to address this issue by synthesizing the data within each of the core assessment areas (i.e., economic, fiscal, social, public health and safety and environmental) into encapsulated trend summaries. It is designed to be easily read, flexible and pertinent to a number of users. It is not technical in design or content. Concurrent with the *Q3 2005 Indicator Brief*, the Program's website recorded its highest number of weekly visits, page views and hits, reflecting increased interest in the Program and the importance a concise, executive level summary.

The second of the communication enhancements is the weekly monitoring program email briefings (Fig. 3.27). These documents highlight those indicators updated during the past week and summarize the salient findings of each in one to two sentences. The intent here was to balance the demand for current information with the problem of user information saturation. Moving to the e-briefing format proved an effective means to balance these needs, particularly when hyperlinks to more information were included (as opposed to Adobe attachments). E-briefings are released on Monday morning; and, while extremely dependent on the type of information released each week, appear highly correlated with increased user figures.

A related but somewhat different communication issue that arose during 2005 was that of general public relations. An increased volume of Program-related inquiries were sourced to governments, the press and professionals seeking to learn from the Program's successes and failures. Additionally, the Program found an expanding role in recent policy discussions increasing its profile through the public and private sectors. Public officials touted the Program's value in developing and maintaining critical community awareness and private sector found value is assessing market conditions, identifying potential issues and monitoring general economic performance. The Program itself was a key component of the televised

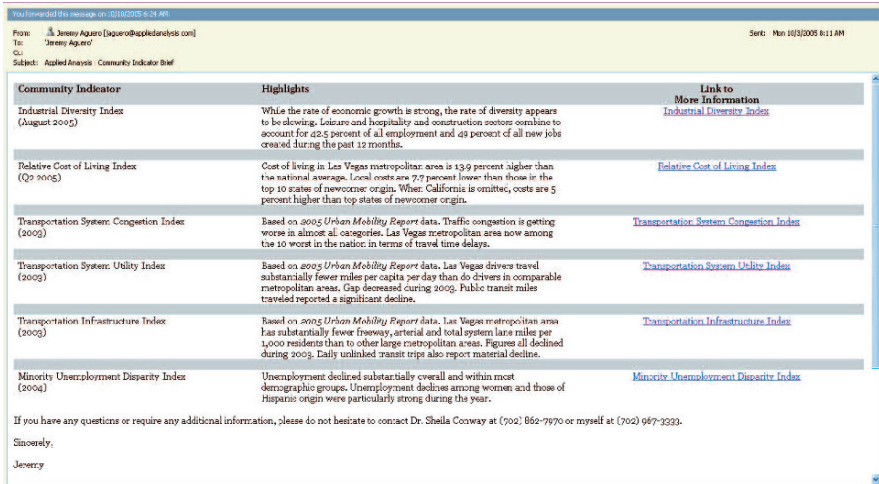


Fig. 3.27 Sample clark county monitoring program e-briefing – October 3, 2005

public hearings surrounding the Clark County Community Growth Task Force. It was also held up as an achievement at the Board of County Commissioners meeting, after the effort was awarded the Nevada Chapter of the American Planning Association’s 2005 DeBoer Excellence in Planning Award.

3.7 Key Lessons Learned

The Clark County Monitoring Program by design is a dynamic, continuously evolving project that has been significantly enhanced by its growing cadre of users. What began as a tool for government decision makers has now been incorporated by not only Clark County but also the cities of Las Vegas, North Las Vegas, Henderson, and Mesquite as another tool for measuring local government performance. In addition, the adoption and use of the Monitoring Program by a larger group of public stakeholders has now broadened its use as a tool for engaging the public in a dialogue about what level of services area residents expect from their local governments. More recently, the business community began to cite the Monitoring Program as a reference for describing market conditions within the Las Vegas Valley. With each new customer, a myriad of lessons have been learned. The key lessons to date are described below.

3.7.1 Communication Is Vital

There is probably not a more important lesson learned than developing an effective communication system, a condition precedent to establishing a program that will receive stakeholder buy in. Both ends of the spectrum provide serious challenges.

Failure to distribute information in a timely manner makes the effort irrelevant from the user perspective. In turn, inundating users with information that they view as “spam” is frustrating and results in significant user attrition. Our communication approach appears to be both effective and efficient. While we are certain that additional refinements will be required over time, positive feedback is at an all-time high and negative feedback at an all time low.

3.7.2 Flexibility Is Key

The learning curve in projects such as the Clark County Monitoring Program is steep and the required participants are many. Having unrealistic expectations that social services or fire protection personnel will have an understanding of statistical significance, the importance of uniform collection or subtleties of variance only complicates the process and frustrates users. Perhaps of equal importance is the unrealistic belief by some researchers that they understand all of the factors influencing the need for child protective services or fire departments rural response capabilities. Any monitoring effort is built on a desire to better understand the community and what impact it; it is a continual learning process. Researchers, public officials, contributors and users must understand and accept the fact that some indicators will change over time, that some data sets will be determined irrelevant while others will become critically important and that change is symptomatic of improvement. Inflexibility in design, content and/or approach is a detriment to long-term success to any monitoring program.

3.7.3 The Program Cannot Be Everything to Everyone

The Clark County Monitoring Program is designed to establish a baseline of information necessary to effectively measure the impacts stemming from the transportation and storage of high-level nuclear waste within Southern Nevada. The economic, fiscal, social and environmental data collected have significant utility beyond this primary purpose. Thus, some users put pressure on researchers to include information with a questionable nexus to the Yucca Mountain Project. Two solutions have been devised to address this issue. First, a rationale statement has been added to each of the indices included in the Program. These statements were cleared through Nuclear Waste Division and legal staff helped quell the demand for extraneous information and analyses. Second, we have identified a second funding source for analyses outside the Program’s initial purview. Thus, when requests are deemed necessary by County administrators funds can be made available to dedicate additional resources to the project.

3.7.4 Qualitative Variables Are Necessary

The vast majority of monitoring or community indicator efforts focus on the empirical, performance measurement data routinely available (e.g., the number of crimes

committed, employment, or welfare caseloads). While these are vitally important, they often omit outcome-based assessments that consider the effectiveness of service provision, its relative importance and/or the perception of consumers (in this case a community's residents). If researchers fail to ask and monitor whether residents feel safe, whether they are concerned about housing affordability, or whether the transportation of high-level nuclear waste shipments are likely to impact their quality of life analysis, their analyses will always be two dimensional, lacking the depth that comes with outcome-based assessment.

3.7.5 Maintaining Independence Is Paramount

Analysts tend to live in a world controlled by the comforts of ones and zeros. Community-based information and assessments, however, are inherently political. Thus, while researchers maintain a significant information asymmetry, any attempt to exercise this advantage to advance a political position will be fatally compromise the work product. In the case of the Clark County Monitoring Program research express no opinion regarding whether the Yucca Mountain Nuclear Waste Repository will be good or bad for Nevada, we simply express the measurable benefits and drawbacks to the program and its related functions (e.g., transportation).

3.8 Summary and Looking Forward

This paper principally focused on history, evolution and process. The natural next question is: *what comes next?* Historical progress has principally been classification-based. Advancements in the field of community monitoring have centered on the ability to count, classify and analyze that which has already occurred. The majority of local-area efforts have been reactive; and, while proactivity is an oft-cited goal, it emerged as an illusory benefit in many cases. Similarly, the overwhelming magnitude of the data combined with a deficit of technical ability and irregular funding led some observers to conclude that the vast majority of indicator efforts are "unfocused, pregnant with unrealistic expectations, poorly developed and designed and doomed to be ignored," (Sawicki, 2002). While there is reasoned evidence to support this position (see, e.g., Cobb, 2000; Wong, 2000), such a conclusion may be overly myopic, blind to both progress and potential.

Indicators systems, such as the Clark County Monitoring Program, reflect significant advancement since President Herbert Hoover instituted the first comprehensive indicator project in 1929 (the President's Research Committee on Social Trends). Improved technology and a heightened focus on sustainability provided both new tools and new motivations for programmatic development, as have idiosyncratic circumstances such as the siting of high-level nuclear waste facilities. While not devoid of growing pains, the form and manner in which information is made available in a knowledge-intensive economy (e.g., the World Wide Web), combined with improved timeliness, utility, reliability and flexibility, have made visible paths

formerly obscured. Moreover, analysts are also benefiting from improved history and standardization, nationally, regionally and locally.

Complex, long-term, evolving programs such as the proposed high-level radioactive waste repository at Yucca Mountain have the potential for impacting affected units of government, including Clark County, over time. It is important that reliable, innovative analysis and dynamic tracking tools be developed to provide decision makers and the public with information that provides an accurate, timely, and relevant picture of past, present and future conditions. The Clark County Monitoring Program, with all of its integrated components, provides a resource upon which the full spectrum of affected stakeholders can rely for baseline setting now, and for tracking changes well into the future. The indices, associated reports and surveys provide an early warning of impacts to Clark County residents and governmental agencies, if not only from the recurring consistency of comparable economic and performance data. What is more is the potential that lies ahead.

The exploration of the future potential of the Clark County Monitoring Program and other similar efforts is predicated on an anticipated evolution of local governance. There is substantial research in this area and reasonable minds may certainly differ as to the expected role, form and service delivery system for a model locality in the 21st Century. This having been said, there are some trends that may foreshadow the changes potentially in store. At the 2005 Future of Local Government Summit, Robin Hambleton, Dean of the College of Urban Planning and Public Affairs at University of Illinois Chicago, provided an outline of some of these key trends in his presentation, *New Leadership for 21st Century Local Democracy* (Hambleton, 2005). These included, among others, concentrated urbanization in metropolitan regions, adaptation to globalization pressures, citizen demands for responsiveness and accountability, social equity in development patterns, a redefinition of public service consumer and repositioning government as having the “power to influence” rather than the “power to control.”

While this is a meaningful synthesis of common expectations, it is admittedly an incomplete, skeletal structure. These concepts do point to an important underlying and recurring theme envisioning a two-pronged model of local governance, the first prong providing essential (or core) services, while the second acts as mobile, flexible and targeted resource that can swiftly and efficiently address emergent, short-run concerns. Such an approach abandons the Procrustean notion that governments have a static, optimal form, embracing instead the ideology that local governments, much like the communities which they serve, should be in a constant state of redefinition. This semi-amebic government model raises a number of interesting practical questions (e.g., those relating to labor, capital construction and service segregation), we are principally concerned with how a community indicator such as the Clark County Monitoring Program might evolve concurrently with the governments and communities it is designed to serve. Complex, ever-changing, and long-term programs such as the proposed Yucca Mountain program have the potential of impacting communities like Clark County in a plethora of ways over time. The Monitoring Program implemented by Clark County is designed to provide a dynamic tool to assist decision makers in assessing impacts as the program evolves over time.

Growth is a challenge in many communities particularly as urban forms become increasingly compact in response to higher land and housing prices, structural changes within the national economy and continuing migration of population into large cities (particularly in the West and Southwest). This contributes to a number of problematic secondary affects, from traffic congestion to affordable housing to infrastructure inadequacy. One of the principal problems with community indicator programs as they relate to urban development is that it tends to segment social issues (e.g., housing affordability) from economic, fiscal or geographic considerations. In reality, these considerations are inextricably linked. Similarly, traditional econometric input-output models provide a mathematical representation of commodity and labor demand and production and importation within a defined economic unit, models of community resources and demands within small area geographies are beginning to emerge.

Increased access to information and improved ability to analyze these data (e.g., through community monitoring programs) has created a political environment in which unforeseen consequences should be minimized. If a principal challenge facing local governments is the potential impacts of population growth, and, in turn, a changing urban form, the economic, fiscal, social, environmental and public health and safety impacts of prevailing development policies ought to be nearly transparent. Governments know, or should know, the impact of development on existing water, sewer, flood and other infrastructure as these tend to be non-derivative, unit-based metrics dependent almost exclusively on physical utility and practical capacities. Governments know, or should know, the impact of development on tax collections and service demands. Property, sales, excise, income and other taxes ebb and flow based on business cycles; however, their longer-run trend lines tend to be fairly consistent. The same is also true of the demand for core public services. Governments know, or should know, the impacts of alternative development scenarios on traffic and air quality long before gridlock results or air quality breaches national standards. This is no longer a question of data availability, but rather a community's ability and willingness to use available information effectively. Looking forward, government challenges surrounding the changing urban form will not be the result of a lack of foresight regarding the implications of selected growth patterns; rather, it will be the product of a decision to accept negative consequences in trade for benefits otherwise accruing to the community.

Community indicators programs such as the Clark County Monitoring Program are anticipated to play an increasingly important role as it relates to economic development. One, they can provide a relative gauge of a community's competitiveness in terms of labor quality and depth, housing affordability, supply chain and tax climate. Two, they can provide a gauge for progress in terms of both job creation and local economic diversity. These concepts are far from novel, but in a climate of structural change, the ability to assess and adapt quickly to changing opportunities is increasingly important. Global competitiveness is, of course, a global issue. However, global preparedness is also very much a local issue. The second prong of the economic development question is that of performance tracking. More information than ever is available on employment, wage and economic output growth and

decline by sector along with expansion and siting of new businesses and industrial clustering. These data can, and in many cases are, being tracked on a recurring basis to gauge the effectiveness of economic development policies and the general health of the local economy.

Community indicator programs will increase government responsiveness and enhance government accountability. In many ways governments are plagued with an impossible dichotomy of demands: *be no more than you must be, but be everything that is needed as soon as it is needed*. Being all things to all people is, of course, a Sisyphean either explain or change word task; however, a streamlined, responsive and accountable local government is clearly desirable and a trend promoted by limited resources, diverse demands and lower information barriers. Community indicator programs play a vital role in both responsiveness and accountability efforts. Public sector performance measurement is also an important tool and a topic that is very much in vogue. Generally speaking, performance measurement programs provide a focus on core community services and seek to generate recurring measures of local government's ability to effectively and efficiently deliver those services to the public.

The famous closing phrase of Abraham Lincoln's Gettysburg Addresses held up the virtues of a government "of the people, by the people, for the people." In many ways governments during the better part of the last 150 years are more removed from the general public as governance tended to elevate form over function. The modern model of government, and the one most likely to shape the next century, is one that embraces accountability and one in which government services are increasingly personal. This is not to suggest that governments are becoming, or attempting to become, all things to all people – quite the opposite is clearly the trend. Now, governments are adjusting the lens through which they view public needs, bringing government to the people, increasing focus on accountability and monitoring each function's relative ability to make a difference. Governments will increasingly view resident populations as *consumers*, *customers* and *citizens* (Hambleton, 2005).

The ability to lead begins with the ability to understand and the ability to improve begins with the ability to measure. If governments lose "home field advantage" on information, their ability to govern will be limited as will their practical ability to promote effective policies. While the impetus, focus, and implementation for the Monitoring Program to date was centered around the Yucca Mountain program, the key components of the program are being applied, and can be expanded to apply, to other program areas. This chapter discussed the Monitoring Program within the context of the growth management initiative, and its high potential for linkage to performance measurement at an organizational level. These key components – indicator identification, data collection, analysis, and trend identification, integration of community opinion, and effective communication and reporting can be used by affected stakeholders to enhance both short- and long-term decision making. The transparency and transferability of this unique community indicators system makes it a valuable tool for policymakers across any discipline. Clark County's monitoring program is comprehensive enough to be a broad, stable, defensible source

of information, yet specialized, dynamic, and flexible enough to be responsive to continually changing governmental, organizational, and community priorities today, and into the 21st Century.

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Chapter 4

Evaluating Progress Toward Sustainable Development in Milwaukee's Menomonee River Valley: Linking Brownfield's Redevelopment with Community Quality-of-Life

Christopher A. De Sousa, Benjamin Gramling and Kevin LeMoine

Abstract Once heralded as the industrial heart of Milwaukee, the Menomonee Valley is now referred to as the largest brownfield district in the state of Wisconsin. As in other cities in the Rustbelt, government officials and concerned stakeholders are aiming to ensure a more sustainable future for this industrial district and the local community. This chapter reviews a community indicator study prepared for the Valley by the Center for Urban Initiatives and Research at the University of Wisconsin-Milwaukee and the Sixteenth Street Community Health Center, a Milwaukee nonprofit organization. Specifically, the chapter: (1) describes the procedures employed for identifying priority issues affecting the Valley and the relevant indicators to examine them; (2) outlines the approach employed for gathering and presenting baseline data for the 2003 “State of the Valley” report and for the recently released 2005 report (www.mvbi.org); and (3) summarizes key results from the benchmarking research and reviews the strengths and weaknesses of the initiative. In all, the benchmarking initiative provides a straightforward and cost-effective framework for developing an indicator program that can be applied to monitor brownfields redevelopment and urban renewal efforts in a manner that incorporates community quality-of-life factors.

4.1 Introduction

The Menomonee River Valley lies in the heart of the city of Milwaukee, literally and figuratively. Prior to European settlement, the 1,200-acre Valley was a diverse marsh and wetland ecosystem that provided Native Americans with a plentiful supply of

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resources. Starting in the nineteenth century, European settlers were lured to the Valley by these very resources and by its transportation potential. They built canals, roads, and other structures in order to attract industrial interests to the city. By the 1920s, over 50,000 people worked in the Valley. Industrial decline, however, started to take place in the Valley during the Great Depression of the 1930s, becoming widespread by the late 1970s due to the steady migration of industries to the suburbs, other states, and out of the country. In addition to job losses, the Valley itself was left with many of the negative consequences, both real and perceived, that are typically associated with old industrial brownfield districts – crumbling infrastructure, contaminated soils, vacant buildings, poverty, and so on.

Starting in the mid-1990s, government officials, community activists and those with business interests in the city devised various proposals to remedy the situation in the Valley, embarking upon a slate of initiatives aimed at improving the economic, social, and environmental conditions of the Valley and its surrounding neighborhoods. Despite such valiant efforts, however, the Valley is still perceived by many Milwaukeeans as a decaying void in the center of the city that detracts from the city's reputation and quality-of-life. The lack of public knowledge on the status of the Valley and the paucity of information available for public use, along with the absence of a framework to measure progress against clearly identified redevelopment objectives, constitute the primary stimuli behind the Menomonee Valley Benchmarking Initiative (MVBI) initiated in 2001 by the University of Wisconsin Milwaukee's Center for Urban Initiatives and Research and the Sixteenth Street Community Health Center (SSCHC). The purpose of this chapter is to examine the procedures and early outcomes of the MVBI, focusing on:

- the validity of the procedures employed for dealing with the key issues affecting the Valley from a sustainability perspective and for establishing benchmarks (i.e., indicator/measures of conditions) for examining those issues;
- the key findings of the initiative over the course of the original baseline study in 2003 and the more recent 2005 report; and
- the strengths and weaknesses of the initiative.

This chapter concludes by highlighting the important role that community quality-of-life and sustainability indicators can play in defining and tracking the redevelopment of brownfield districts and of the communities affected by them. Ultimately, the chapter aims to put forward the Menomonee Valley Benchmarking Initiative as a guide for other communities interested in implementing a similar program to track redevelopment and urban renewal efforts.

4.2 Background: The Menomonee River Valley

The Menomonee Valley, located just southwest of Downtown Milwaukee, Wisconsin, has always had an important influence on the social and economic life of the Milwaukee region. Its trails, fish, and waterfowl provided the necessities of daily life

to early Native American populations. As European settlement increased in the late 1800s, the Valley's accessibility to railways, Lake Michigan, and local river systems made it a prime location for industrial activity. In 1869, a group of business leaders supported by local authorities planned a network of canals and slips in the Valley surrounded by parcels of land for industrial use. The project took barely a decade to complete, even though it required vast quantities of material to fill the marsh, including dredge spoil, gravel, and municipal and industrial wastes. As the noted Milwaukee historian John Gurda aptly observed (1999, p. 126), "lumber yards, coal yards and sash and door factories sprouted in the eastern end of the Valley even before the muck was dry."

Larger industrial complexes, including tanneries, breweries, stockyards, and railroad shops dotted the entire Valley by the late 1800s. The transformation of the Valley from a natural ecological system to an industrialized one is the feature that has most epitomized Milwaukee's evolution. By the end of the nineteenth century, residential communities had spread extensively along the Valley's bluffs, producing some of the most densely populated and ethnically diverse neighborhoods in the State of Wisconsin and the nation. Industry prospered and expanded well into the 1920s, despite problematic labor movements and prohibition. Only the Great Depression of the 1930s could curtail industrial growth in the Valley, which picked up dramatically with the onset of World War II in response to wartime needs.

The industrial growth of the Menomonee Valley, and its crucial role in Milwaukee's economy, began to decline in the decades following World War II. The construction of interstate highways made it possible for people to live further away from their place of work and for industry to ship goods via highway. This led to a reduction in use of the Valley's railways and waterways. By the 1970s, the Valley suffered the same fate as other urban industrial centers in the so-called Rustbelt – it saw an exodus of industry to the suburbs and to other countries in search of more space, less regulation, and lower wages (McMahon, Moots, & White, 1992). Indeed, the Valley witnessed employment drop from over 50,000 jobs in the 1920s, to approximately 20,000 jobs in the mid-1970s, to barely 7,095 jobs by 1997 (City of Milwaukee, 1975; White, Zipp, Reynolds, & Paetsch, 1988). While recent economic growth has generated more economic activity within the Milwaukee region, such activity tends to occur primarily at the edges of the metropolitan area, not in the Valley or in the city itself, where one third of the metropolitan area's population resides and most of its poverty and unemployment is concentrated (McMahon et al., 1992; Center for Economic Development, 1998; Wood, Whitford, & Rogers, 2000).

With economic decline, a host of problems followed. A "spatial mismatch" between people in the city and jobs in the suburbs limits the access of Valley dwellers to employment opportunities that were once a short walk away. The flight of industry and wealth from the city, combined with the flight of the middle and upper classes to the suburbs, resulted in a diminished city tax base and, thus, a diminished ability to provide basic services and address social problems. In addition, over one hundred years of industry left a legacy of environmental pollution in the Valley, while old buildings stood vacant and underutilized.

Over the past ten years, a significant amount of time and attention has been paid to position the Valley to serve as a driving force in the city’s economic resurgence. A broad collection of partners from Milwaukee’s public, private, and nonprofit sectors have worked together to develop a vision for the Valley that sees new businesses relocating to lands cleansed of past environmental contamination and providing family-supporting jobs to residents of nearby neighborhoods. At the same time,

Table 4.1 The history of the valley (based on Gurda, 2003)

10,000 years ago	The Menomonee Valley, formed by meltwater during the retreat of the last continental glacier, is a sprawling expanse of open water punctuated by beds of wild rice and dense mats of cattails, rushes, and reeds.
1600s	The Valley becomes a critical resource and a favored location for the Potawatomi, Ojibwe, Odawa, Sauk, Fox, and other tribes who settle in Milwaukee.
1795	Jacques Vieau, sometimes described as the first permanent white settler in Milwaukee, opens a fur trading post atop the Valley’s bluff.
1830s	Settlement wave reaches the western shore of Lake Michigan and Milwaukee comes into urban existence as a trio of competing settlements along the Menomonee Valley (Juneautown, Kilbourntown, and Walker’s Point).
1847	One year after Milwaukee becomes a city, Byron Kilbourn founds the Milwaukee & Waukesha Railroad linking the lake Michigan shore with its hinterland. The railroad makes its maiden run up the Valley in 1850. Railroads multiply and mammoth grain elevators rise along the margins of the Valley, and by 1862 the city becomes the largest shipper of wheat in the world.
1869–1900	A group of local businessmen launch the Menomonee Improvements to develop a system of canals, boat slips, and rail sidings in the Valley. Considered to be Milwaukee’s most ambitious infrastructure project of the nineteenth century, it involves the extensive filling of the marsh. The Menomonee Valley ultimately boasts nearly 1,400 acres of “made land,” several miles of docks, and some of the best rail connections in Wisconsin.
1850s to mid 1900s	Extensive industrial growth takes place that includes assorted processing plants, storage and transfer facilities, and manufacturing. Milwaukee becomes the self-proclaimed “Machine Shop of the World” in the late 1800s, with a particular emphasis on all sorts of metal-bending activities in the Valley. Industrial employment reaches 50,000 in the 1920s and the image of a polluted, but prosperous, Valley grows.
Post 1945	The shift to truck traffic, technological change, urban sprawl, and other factors lead to the de-industrialization of the Valley and the presence of brownfields. By the mid-1970s employment is down to 20,000.
Late 1970s	The city’s first efforts to revitalize the Valley by rebuilding roads, clearing blight, and purchasing and developing land are seen as “less than a transformation.”
Late 1990s	Redevelopment efforts gain momentum. <i>A Market Study, Engineering and Land Use Plan for the Menomonee Valley</i> , sponsored by the City of Milwaukee Department of City Development (DCD) to update the City’s Master Plan, is released in 1998. The Menomonee Valley Partners, Inc., is established in 1999 as a public-private partnership to guide the redevelopment effort. Employment is estimated at a little over 7,000.
2001	The Menomonee Valley Benchmarking Initiative (MVBI) is established to systematically track and study the community, environmental, and economic conditions of the Menomonee Valley.

a new emphasis has been placed on the health of the Menomonee River and on creating new opportunities for recreation and community amenities to support Milwaukee's diverse residents. Together, this vision of economic development, environmental restoration and community well-being forms the sustainable approach to redevelopment that is intended to guide new investment and the Valley's overall renewal. Yet despite this, little is known about the effectiveness of these activities in renewing the Valley and improving the community's quality of life. Part of the long-term aim of the MVBI is, in fact, to examine what impact redevelopment initiatives have on the "state" of the Valley and better communicate this information to the public, which will, in turn, likely encourage further support for renewal and redevelopment efforts (Table 4.1).

4.3 MVBI Objectives and Indicator Selection

The Menomonee Valley Benchmarking Initiative (MVBI) was envisioned as an interdisciplinary, collaborative effort to systematically track and study the environmental, economic, and social issues affecting the Valley within a sustainability framework. Although some preliminary work in establishing benchmarks had been carried out by the Sixteenth Street Community Health Center (SSCHC) in 1999, a partnership was created with the University of Wisconsin-Milwaukee in order to draw on the scholarly expertise, impartial perspective, and information dissemination capabilities of the university. Two project coordinators were responsible for guiding the process: a Geography Professor from the University of Wisconsin-Milwaukee and the Sustainable Development Program Manager for the SSCHC. The budget for the project was limited to approximately \$20,000, which came primarily from a private Milwaukee-based foundation.

The objectives of the MVBI were clearly defined by the university and the non-profit at the onset of the project (see Table 4.2).

Two specific tasks were carried out to prepare the first MVBI report. These were:

1. to identify suitable benchmarks for studying the economic, environmental, and social state of the Valley; and
2. to gather data for and to prepare the report.

Table 4.2 MVBI objectives

To raise awareness in the community regarding the current state of the Menomonee Valley and the progress made towards its revitalization;
To create an information clearinghouse on data related to environmental, economic, and social indicators;
To promote the principles of sustainability in an urban context by exploring issues and assembling data in a more holistic manner that considers economic, environmental and social concerns;
To generate a practical synthesis of the raw data for the benefit of a wide variety of users;
To stimulate research interest in the Valley as a complex laboratory for studying urban environments.

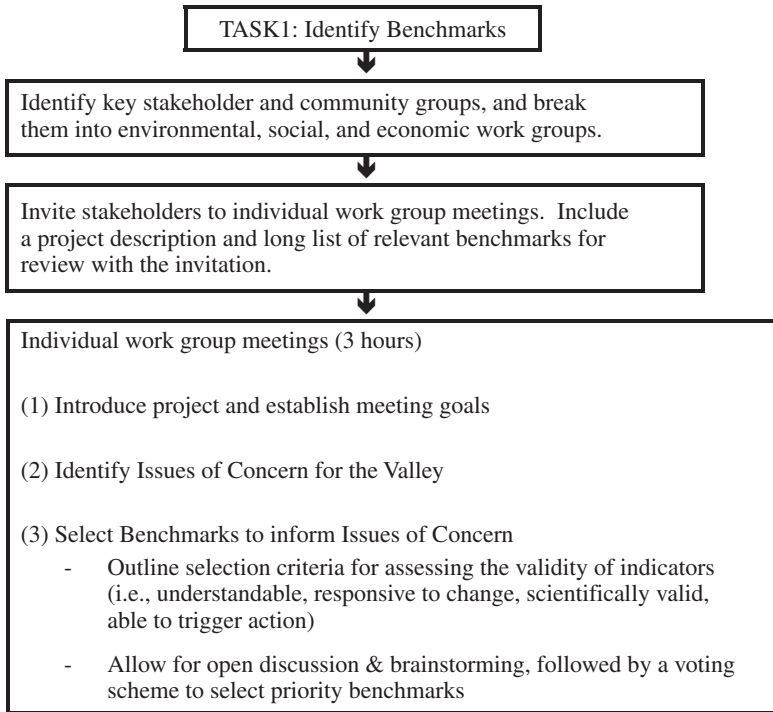


Fig. 4.1 MVBI Task 1, identify benchmarks

The first task set the framework for the study (see MVBI task 1 flowchart above) (Fig. 4.1). Hundreds of potential economic, social, and environmental indicators needed to be examined in a systematic and efficient way in order to identify the most relevant ones for the Valley. To this effect, three small (3-hour) “Indicator Work Group” meetings (1 social, 1 environmental, and 1 economic) were organized in the fall of 2001. Over 40 people, representing key stakeholder and community groups, participated in identifying suitable benchmarks for the MVBI. This involved ascertaining key “issues of concern” for the Valley first, and then selecting specific “indicators” for investigating those issues on the basis of their overall relevance; that is, whether they were: (1) understandable to a larger public; (2) perceivably responsive to change; (3) scientifically valid; and (4) able to support or trigger action. The coordinators of the study and the stakeholders agreed that the MVBI should not focus on historical trends and legacies, but evaluate the Valley’s future progress based on its conditions at the start of the new millennium.

Prior to the meetings, work group participants were sent a description of the project and a long list of hundreds of potential indicators to review. At the meetings, the objectives of the study were discussed. The selection of issues of concern was rather straightforward. However, the selection of specific indicators to study those issues was more difficult because stakeholders suggested too many indicators (the

original objective was to select 30 indicators, 10 per group). Consequently, a voting scheme was employed whereby each individual was given 10 votes and asked to place them on the list of indicators that had been suggested. Interestingly, workgroup participants were satisfied with this democratic approach to selecting the indicators and there was no disagreement with the final list of indicators selected.

All in all, the Economic Work Group identified 4 key issues and 21 benchmarks, the Social/Community Work Group identified 4 key issues and 18 benchmarks, and the Environmental Work Group identified 4 key issues and 12 benchmarks (see Table 4.3) – all of which were seen to convey a broad sustainability picture of what is important to stakeholders. For instance, “Water Quality” in the Menomonee River was one issue of concern identified by the environmental work group, and “Dissolved Oxygen” was selected as an indicator to help evaluate water quality. The

Table 4.3 2005 MVBI issues & benchmarks

<i>Community</i>			
Health	Crime	Housing	Arts & events
<ul style="list-style-type: none"> ● Birth rates ● Child lead ● Poisoning rates ● Ozone action days 	<ul style="list-style-type: none"> ● Number of selected offenses 	<ul style="list-style-type: none"> ● Owner-occupancy ● Number of residential housing units ● Housing values near the valley ● Household income ● Household ethnicity 	<ul style="list-style-type: none"> ● Public art installations ● Community recreation
<i>Environment</i>			
Water quality	Air quality	Land cover & habitat	Flora & fauna
<ul style="list-style-type: none"> ● Index of biotic integrity ● Physical water quality parameters 	<ul style="list-style-type: none"> ● Particulate matter (PM 2.5) ● Air toxics ● 1-Hour ozone ● 8-Hour ozone 	<ul style="list-style-type: none"> ● Percent of impervious surfaces ● Percent of canopy cover 	<ul style="list-style-type: none"> ● Breeding bird population ● Native and non-native tree species
<i>Economy</i>			
Commercial property	Employment	Business	Infrastructure & access
<ul style="list-style-type: none"> ● Amount of developed property ● Land utilization ● Average value per square foot ● Total assessed value ● Average net rent 	<ul style="list-style-type: none"> ● Employment by business activity ● Total number of employees ● Number of jobs per acre ● Average salary ● Residential location of employees ● Provision of health insurance 	<ul style="list-style-type: none"> ● Type of business activity ● Total annual sales ● Local sales and expenditures ● Adv./Disadv. of the valley for business ● Percentage of local ownership 	<ul style="list-style-type: none"> ● Road access ● Rail access ● Linear feet of sidewalks ● Bus routes, bus stops and ridership

number of indicators was expanded to 57 for the 2005 State of the Valley report. These were added because they complemented and refined existing indicators. Planning for the 2005 report commenced in 2004, and the budget for that report was slightly higher at \$30,000 provided primarily by a private, regional foundation.

Several important implications that can be drawn from the benchmark selection experience with regard to community quality-of-life indicator processes are first, the use of smaller working groups is an efficient and effective way to determine indicators, as long as: (1) a broad range of stakeholders are represented, (2) the project’s objectives are clearly defined, and (3) a straightforward strategy is established for identifying indicators. Secondly, organizing groups by domain (environmental, economic, social) and then asking them to come to a consensus on key issues first, and then to select suitable benchmarks for studying them, is an effective approach for sorting through the enormous number of potential indicators in a short amount of time. Last, those setting up and facilitating the meetings should note that economic stakeholders tend to agree upon certain “standard” issues and benchmarks to be studied, environmental stakeholders agree upon certain “standard” issues, but less so on the specific indicators to be measured, while there is much less agreement among social stakeholders overall.

Another interesting issue that emerged from a geographic perspective was that different groups defined the Valley community and study area differently. For

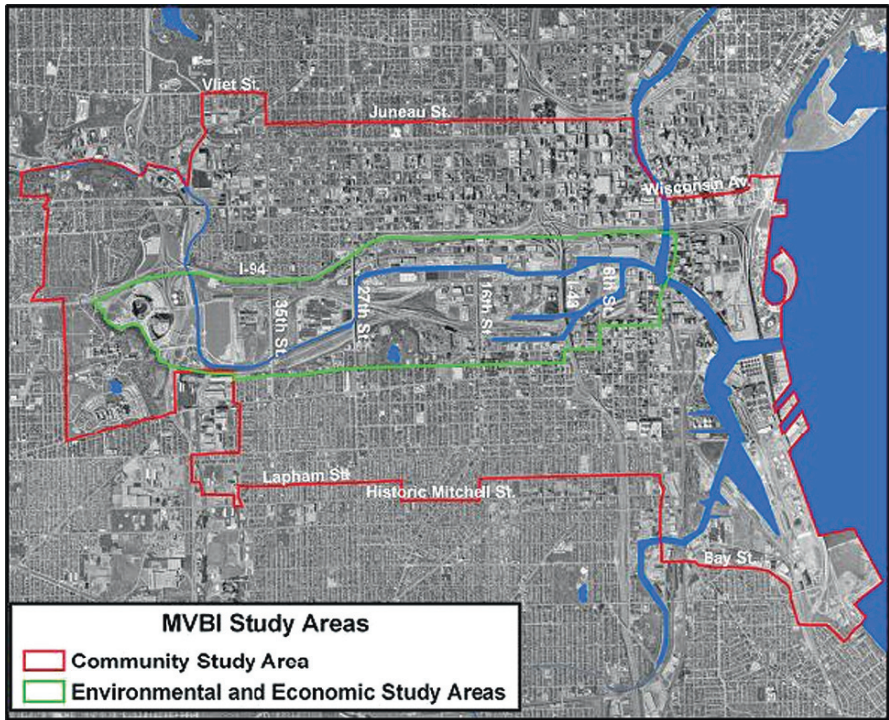


Fig. 4.2 MVBI study areas

instance, the economic group defined the Valley as the large industrial area that lies within a specific census tract; the environmental group was interested primarily in the portion of the Valley within the bioregion defined by the bluffs (which are roughly the bounds of the census tract); and the community group defined the Valley as consisting of the industrial area and its surrounding neighborhoods (which the group defined as the industrial census tract identified by the economic and environmental groups, and a buffer of twenty-nine adjacent tracts). Consequently, the Community study area differs from the Environmental and Economic ones (see Fig. 4.2).

4.4 Data Collection

Preparing the first MVBI report (Task 2) involved identifying stakeholders willing to supply existing data or gather and supply new data, and then to report the results. While some of the data could be gathered from existing sources (e.g., the 2000 US Census, city records), a significant amount had to be collected from scratch. In many community indicator studies, a paucity of data will often result in an indicator not being selected (Maclaren, 2001). For this reason, it was felt that establishing a protocol and making arrangements for future data collection was an important aspect of the MVBI process. To organize the data collection effort, the coordinators split the benchmarks between themselves, with the nonprofit member overseeing the environmental indicators, the university member the economic indicators, and both sharing the community indicators. A similar approach was taken for the 2005 report, however the whole process was greatly facilitated by the hiring of a half time (20 hours per week) graduate project assistant who was involved in the project from its initial planning in the spring of 2004 to the report's publication in February of 2006.

The data gathering process was very extensive for both studies. Indeed, those contemplating a similar initiative should note that each indicator is an individual research project with specific literature contexts, experts, and data collection and reporting protocols. Measuring and tracking the state of economic activity in the Valley was a central focus of the MVBI given the municipal government's focus on economic development activity. The key issues identified by stakeholders for assessing the Valley's economic vitality are: (1) the degree of business activity, (2) the state of employment, (3) the number and conditions of commercial properties, and (4) the quality and nature of infrastructure/access. Unfortunately, much of the information on business activity and employment benchmarks for the Valley was not available. Therefore, a comprehensive data gathering effort was undertaken using a survey method designed by stakeholders that participated in the Economic Work Group meetings that involved a mail survey of businesses in the Valley and a follow-up telephone survey with non-respondents. The survey work was carried out by UW-Milwaukee's Center for Urban Initiatives and Research. One hundred and thirty businesses were contacted and information on ownership, headquarters, sales, purchases, and employer opinions about the Valley as a place to do business was gleaned in this way. In all, 78 businesses responded to the survey for the 2003 study (22 to the initial mailing and 56 to the telephone follow-up) and 95 for the 2005 study. Data on commercial property was gathered primarily from property

assessment data maintained by the City of Milwaukee and information on the quality and nature of infrastructure/access was gathered via digital photographs and the local transit authority.

Given that the Menomonee Valley suffered considerably from past environmental degradation, the MVBI devoted a significant amount of time to developing air, water, ecosystem and wildlife monitoring networks to better understand the state of the Valley environment and to evaluate the impacts of redevelopment on the environmental issues identified by stakeholders. The MVBI worked with a number of key scientists from the university to establish a water-quality monitoring network to conduct research on biotic integrity and physical water quality in the Menomonee River. The MVBI also worked with the Wisconsin Department of Natural Resources (DNR) to analyze data from local air-monitoring stations to identify concentrations of atmospheric ozone, air toxins and small particulate matter in the Valley. Information on land coverage and bird breeding activity was carried out by graduate students and an array of stakeholders and volunteers from local birding organizations and nonprofits.

Measuring and tracking the state of the Valley community involved gathering information on indicators related to such things as recreation, housing, health, and crime rates. Data on recreation and art was gathered by students in the Geography Department as part of a fieldwork methods course. Housing and crime data was obtained from relevant city departments. The MVBI worked with local and state health agencies to gather relevant data pertaining to health and pollution indicators identified by the stakeholders: namely, general fertility rates, lead poisoning rates, and the number of Ozone Action Days in a given ozone season.

In all, the joint coordination of the project by a university and a local nonprofit made it possible to access leading researchers in the field, student support, and a variety of nonprofit groups involved in specific issues (e.g., birding, crime, greenspace), in addition to various government departments at the local and state level. The addition of a project assistant, funded to work on the project for approximately 20 hours per week, also enhanced the capacity of the group in terms of project management, data collection and analysis, and reporting. Those contemplating such projects should note that while government agencies were very cooperative in providing data, having a city and/or state government representative on the project coordination team could help facilitate data gathering and analysis efforts. It should also be pointed out that given the extensive scope and difficulty involved in gathering data for such studies, future MVBI reporting efforts will be carried out every five years as opposed to two.

4.5 Production and Dissemination of Results

The results of the first State of the Valley study were disseminated through a short summary pamphlet and more comprehensively through a project website (www.mvbi.org). The website was selected as the principal means for disseminating

results because it was initially felt by the coordinating team that this format was widely accessible, easy to update, linkable to related initiatives on the Internet, and cost effective to publish, particularly given that the write-up for each indicator ranged from three to six pages in length. A pamphlet listing the website address and summarizing the results was also mailed to several hundred public- and private-sector stakeholders, community groups, nonprofits, and community members who's names were derived from mailing lists retained by the coordinating team and the Menomonee Valley Partners. For the 2005 report, the desire was to make the results more reader friendly and to "put a copy" in the hands of key public, private, and nonprofit stakeholders via a more formal report available in hard copy, as well as on the website. Preliminary reactions from stakeholders reveal that distributing a more formal and complete report, instead of a pamphlet with a website, was a better approach because recipients were more likely to peruse the document in their hands than go to the web.

The layout of the 2005 report was also modified from the 2003 web report in order to improve its organizational structure and make it simpler to read. The 2005 report commences with an overall introduction to the Valley and the MVBI, and includes maps of the study areas. Indicator analyses are then sorted into three sections (Economy, Environment, and Community), and each section commences with an introductory page that highlights the most important results from the section and presents an index of the issues and indicators examined. The analysis of each indicator addresses three fundamental questions (Table 4.4):

Table 4.4 Questions guiding indicator analysis and write-up

-
1. What has been measured? – describes the measures, sources of data, and methodological approach used for evaluating the indicator's performance.
 2. Why is it important? – explains the indicator's role in achieving sustainability in the Valley community.
 3. How are we doing? – describes the performance of each indicator within the study area by means of an examination of past trends and current conditions.
-

The analysis of each indicator is summarized on a single page, and tables, figures, and/or maps are employed to help clarify the results by providing a snapshot view of performance (see Fig. 4.3 for an example of a typical page from the report). Each page also begins with a newspaper-style heading that sums up the analysis. As many readers have pointed out, the single page discussion organized along the three questions significantly improves the structure and the readability of the report, and also ensures that every indicator is given equal attention. The maps, charts, pictures, and other graphic images also bring the report to life, making it more enjoyable to read and easy to comprehend.

Following the indicator analyses, a section entitled Vital Signs presents raw data by census tract intended for those stakeholders, particularly community groups that might benefit from more detailed data for their planning and programming activities. An Appendix is also included at the end of the report that presents more detailed information for specific indicators. In all, the 2005 report represents a "best case"

Crime: Number of Selected Offenses

Crime Decreases Slightly, but Remains Higher than City Rates

WHAT HAS BEEN MEASURED?

The number of incidents, by census tract, of eleven categories of reported offenses from 2002 to 2004 in and around the Valley data was gathered from the City of Milwaukee's COMPASS database.

WHY IS IT IMPORTANT?

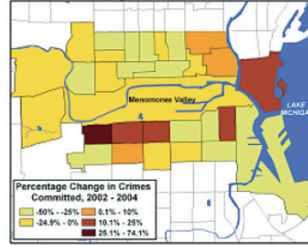
In addition to personal injury and financial losses resulting from criminal activity, crime has a negative impact on the character of a neighborhood and perceptions about its overall livability. The frequency of assaults, homicide, and theft provide a good indicator of overall community safety, while vandalism, prostitution, and disorderly conduct offenses influence the perceived quality of life in a community.

HOW ARE WE DOING?

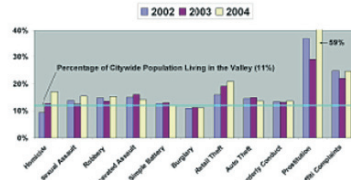
For most categories of crime, the per capita crime rate in the study area is slightly higher than the citywide crime rate. Homicide and retail theft have increased slightly each year in and around the Valley as a percentage of citywide incidents. Charges of prostitution as a percentage of citywide incidents almost doubled from 2003 to 2004 due to stronger police enforcement—59% of all prostitution charges in the city occurred in the study area.

The vast majority of census tracts in the study area saw a decrease in total crime between 2002 and 2004. South of the Valley, the increase was due to more charges of prostitution. To the Valley's southeast there was an increase in assault and battery charges while burglaries and theft increased to the east.

Percentage Change in Total Crimes Committed, 2002-2004, by Census Tract*



Crime in and around the Valley as a Percentage of Citywide Crime



* Crime Complaints are not included in total crime calculations.
- Data source: The City of Milwaukee's Community Mapping and Analysis for Safety Strategies (COMPASS) program
- See Crime "Vital Signs" for detailed information (p. 99).

Fig. 4.3 Typical page from the 2005 report

because it has a more methodical and multi-layered structure that encourages the reader to flip through the whole document, but also allows them to focus on their specific section or benchmark(s) of interest.

4.6 Summary of Results

As mentioned, a summary of the key findings of the MVBI is provided at the start of each issue section in the 2005 State of the Valley report. These highlights are presented and discussed briefly here. The complete report can be found at www.mvbi.org

4.6.1 The State of the Valley Economy

The main priority of policy-makers and economic development officials in charge of brownfields districts tends to be economic renewal. The economic highlights of the MVBI report include:

- Employment in the Valley and in the manufacturing sector declined slightly between 2002 and 2005, while service employment grew.
- Job density, average reported salary, and total annual sales rose.

- One-fourth of Valley employees now live in closely surrounding areas.
- The assessed value of commercial property in the Valley has risen faster than the average city value.
- Businesses view its central location as the main advantage to locating in the Valley.

Information gathered for the 2005 report paints a less grim picture of the Valley's economic state than many Milwaukeeans perceive. While the survey found that employment declined (overall and in manufacturing), the decline was due primarily to the loss of a single large company that was forced to move out of the Valley due to a multi-million dollar highway project. With permission from that business, we were able to point out that employment actually rose in the Valley if that company was not considered in the analysis. Other key variables pointed in a more positive direction, including growth in job density, average salary, annual sales, commercial property values, commercial rental rates, health insurance to part-time employees, the number of access roads, and the number of businesses locally-owned and headquartered in the Valley. There was also a slight increase in the proportion of Valley employees living in adjacent neighborhoods, which is considered a very important indicator because it captures the link between job growth in the Valley and community benefits from that growth. One particular question from the business survey that captures the positive transformation of the Valley relates to the primary advantages and disadvantages of doing business there. In terms of advantages, employers like the Valley's central location, freeway access, proximity to downtown, and access to workforce, while the most common response for its disadvantages was "none" (other responses included traffic, crime, high taxes, and construction inconveniences). That said, a few economic indicators were less positive and require attention, including a slight decrease in the provision of health care to full time employees and a reduction in the number of transit routes servicing the Valley.

4.6.2 The State of the Valley Environment

The Menomonee Valley has suffered considerably from past environmental abuse and degradation stemming from poor land stewardship. Redevelopment activities in the Valley seek to ensure that environmental objectives (e.g. improved water quality) are taken into consideration. As mentioned, the MVBI developed air, water, ecosystem, and wildlife monitoring networks to assess the state of the Valley environment and to evaluate the impacts of redevelopment on the environmental issues identified by stakeholders. The highlights of the environmental section of the report include:

- Water quality problems in the Menomonee River continue to be linked to stormwater management throughout the watershed.
- On average, 2004 atmospheric ozone concentrations were lower than 2003 concentrations, while some toxic air pollutants remain at unhealthy levels in and around the Valley.

- The quality of land cover and amount of habitat is limited due to the extent of impervious surfaces in the Valley (62% of all Valley land), and tree canopy coverage totaled a mere 3.4%.
- The Valley is home to a surprising number of breeding bird species and a strong component of native tree and shrub species – perhaps due to recent ecosystem restoration efforts; but invasive species continue to threaten the Valley, and should be managed aggressively.

On the whole, the study revealed that the environmental condition of the Valley is generally poor, but that many opportunities for renewal exist. In terms of water quality, an Index of Biotic Integrity (IBI) that examines aquatic ecosystem health on the basis of 10 individual metrics for the Menomonee river and the local canal received scores of poor and fair, and samples of temperature, conductivity, dissolved oxygen, pH, and turbidity also revealed many challenges associated with dealing with pollutants entering the Valley from throughout the watershed. Air quality benchmarks were also mixed, as ozone levels were generally safe, but four of the five air toxics examined (Formaldehyde, Acetaldehyde, Benzene, 1,3-Butadiene, and PCBs) remained above their respective risk factor thresholds (the atmospheric concentration at which there is a cancer risk to 1 in 1 million people exposed over a lifetime). While the data on bird diversity was a more positive sign, all environmental issues in the Valley were negatively affected overall by land coverage deficiencies; that is, tree canopy covers only 3.4% of the Valley and 62% of the Valley's surface is impervious.

4.6.3 The State of the Valley Community

A meaningful vision for a redeveloped Menomonee Valley must take into consideration ways of interconnecting new jobs and a restored environment with community life. Measuring and tracking the state of the Valley community involved gathering information on indicators related to such things as recreation, housing, health, and crime rates. The highlights from the 2005 report include:

- Housing values closest to the Valley have soared in the last five years, demonstrating that proximity to older industrial areas does not necessarily negatively impact residential real estate.
- Childhood lead poisoning rates near the Valley continue to decline steadily.
- The neighborhoods surrounding the Menomonee Valley are highly ethnically diverse.
- Neighborhoods to the south of the Valley are strong in culture with numerous community recreation opportunities and public art installations.

Many of the community indicators painted a more positive picture of the state of the Valley. In terms of housing, owner occupancy rates rose, over seven hundred new housing units were constructed, and property values surrounding the industrial part of the Valley also rose. Crime and lead poisoning rates witnessed a decline. Interestingly, many stakeholders wanted to know more about the availability of

artistic installations and recreation venues in the Valley because they saw them as ways to revitalize its “blighted” image and draw people into the area. A group of geography students from the university armed with GPS units, digital cameras, and a broad definition of art and recreation, found an increasing number of these sites throughout the Valley community. On the negative side, many of the neighborhoods surrounding the Valley continue to reveal a racial structure that is separated geographically – residents to the east and west of the Valley are predominantly white, African Americans live to the north, and Hispanic nationalities to the south. Many of those living in and around the Valley also live in relative poverty, as incomes are one third less than the city average.

4.7 Discussion

Community quality-of-life reporting activities aim to educate the public, inform policy-making efforts, and monitor the performance of policy-making and other renewal activities (Tyler Norris Associates, Redefining Progress, & Sustainable Seattle, 1997). The MVBI has been attempting to achieve all three of these objectives by gathering analytical information reflective of overall Valley redevelopment. While it is still too early to fully gauge the impact of the initiative, some benefits have already emerged. First, the MVBI reports have achieved several of the key goals put forward at the outset – creating an information clearinghouse on Valley data; promoting the principles of sustainability in an urban context by linking the economic, social, and environmental issues that concern stakeholders; and generating a useful synthesis of raw data for the benefit of a wide variety of users. In addition, it has brought together, in a collaborative effort, disparate stakeholders, coordinators, data gatherers, and other participants to establish a human resources network.

The initiative has also helped establish protocols for gathering new information. In some cases, the MVBI even helped preserve and enhance existing monitoring programs, some of which were on the verge of being discontinued (as, for example, the DNR's air monitoring station in the Valley). It also revealed the important role university students and faculty can play in gathering information, although methodological issues need to be established at the onset and salaried labor is typically more effective than voluntary labor. Indeed, the willingness to gather new information for the MVBI by many stakeholders made it possible to overcome the data availability obstacle, which Maclaren (2001) found to be the foremost barrier to producing indicators that are considered significant to stakeholders. Furthermore, the preliminary focus on gathering and describing baseline information and building on that data, as opposed to examining long-term historical trends, also helped establish the MVBI as a proactive and constructive process. Publishing the study results in a straightforward manner also made the results understandable to the general public, while additional data was made available for community groups and other readers seeking greater detail.

The MVBI has however encountered some problems that should be taken into consideration by those contemplating a similar initiative. It found, for instance, that

indicator reporting is time-consuming and difficult to coordinate given the extent and range of data and of its sources. It is particularly difficult for university faculty to become deeply engaged given the focus of merit and tenure compensation on scholarly publication, not community based reports. As mentioned, these issues were mitigated to some extent by hiring a project assistant who was engaged in the 2005 report project for almost two and a half years, and was able to walk it through data collection to report publication. However, there are a few problems with relying on graduate student support; namely that they are only around for two to four years and it is difficult to find a single individual with the range of skills needed to help coordinate and prepare an indicator project (e.g., strong organizational and writing skills, the ability to handle qualitative and quantitative data, knowledge of mapping and graphic software, the ability to deal with multiple-stakeholders, presentation skills). The complexity and time consuming nature of the reporting process was a key factor in the decision to conduct future studies every 5 years, despite some fear that the initiative may lose momentum in the interim.

There are also issues related to stakeholder “buy-in” that need consideration, as well as time, to improve. For instance, the initial MVBI study found that many stakeholders will participate in meetings where indicators are to be determined, but that few will aid with the data collection, and even fewer with the report writing, thus passing on the burden to the coordinators. However, things did improve for the 2005 study as more stakeholders became committed to the project’s objectives, seeing it as a long-term initiative as opposed to a “one-off” study. Having a full time coordinator also helped cultivate these relationships.

Furthermore, while the 2005 report attracted more attention from the media and from public, private, and nonprofit stakeholders than the 2003 study, the coordinators had hoped for a stronger response from the economic development and business community given that they are largely in charge of coordinating and funding redevelopment efforts in the Valley. The question then becomes whether such groups are truly that interested in having their activities tracked with such detail and via a framework that links environmental and social factors with traditional economic ones.

In a best-case scenario, the local municipal government and/or the Menomonee Valley Partners, Inc. would be much more involved in the indicator project because they benefit from a strategic perspective by aligning their respective investment of time and resources to address problems that may be uncovered by the MVBI over time. Indeed, the Menomonee Valley Partners, Inc. Board of Directors could utilize the data provided by the MVBI to evaluate their effectiveness in fulfilling their organizational mission, and the City of Milwaukee could similarly utilize this information to justify the deployment of taxpayer-generated resources in support of redevelopment in the Menomonee Valley. Although some might question whether their input and information would be impartial, more involvement from key agencies would help ensure the longevity of the initiative and improve the chances that problems will be identified and addressed in a way that validates and reinforces their core organizational activities and objectives.

4.8 Concluding Remarks

In sum, the MVBI project has shown the workability of a multi-disciplinary and sustainability-oriented approach to understanding and assessing change in the Menomonee Valley, Wisconsin's largest brownfields district. In acting as links between various disciplines and stakeholders, it shows that universities and non-profits can play a central role in improving community life. As for the benefits, the community quality-of-life reporting process allows stakeholders from various sectors, as well as students, to become actively engaged as a group in community affairs.

It is hoped that the MVBI will encourage others to undertake similar benchmarking initiatives to track brownfields redevelopment and neighborhood renewal efforts generally. The MVBI framework is relatively straightforward to follow, cost-effective to undertake, and can be managed by a small coordinating team working on a part-time basis. That said, the amount of work carried out by the coordinating team is dependent on the amount of buy-in from other stakeholders, as well as from students who can work at varying capacities (e.g., class related activities, volunteer efforts, internships, or paid project assistantships). Other groups seeking to replicate this project are advised to set manageable goals and to establish a clear framework to guide the process from start to finish. While it is essential to provide opportunities for stakeholders and community members to discuss issues and help shape the process, setting clear objectives and timelines early on will point to the seriousness of the initiative. It is hoped that the framework outlined here, and the modifications made for improving the 2005 report, give readers a head start for implementing a successful indicators program.

While research has not been carried out to determine whether (or to what extent) the MVBI project has influenced redevelopment in the Valley, the knowledge that community quality of life factors are being tracked in a systematic and public way ensures that the issue remains on the radar screen of government, the private sector, nonprofit organizations and the general public. Indeed, the initiative has already noted an improvement in many of the indicators tracked between 2003 and 2005. Communicating this information to the public and interested stakeholders, we believe, will ultimately support the efforts of those guiding redevelopment and investment decisions and ensure that those who live, work, and play in the Menomonee Valley achieve a higher quality of life.

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Chapter 5

Examining the Spatial Distribution of Urban Indicators in São Paulo, Brazil: Do Spatial Effects Matter?

Mônica A. Haddad

Abstract In this chapter, we use two urban indicators to examine intra-urban inequalities in the municipality of São Paulo, Brazil: the Human Development Index (HDI), from the United Nations Development Program, and the Economic Concentration Index (ECI), proposed in this study. Using district-level data, we apply Exploratory Spatial Data Analysis (ESDA) methods that account for spatial effects, that is, spatial autocorrelation and spatial heterogeneity. Spatial autocorrelation occurs when value similarity and locational similarity coincide. Spatial heterogeneity exists when structural changes related to location are detected in the data set, and spatial regimes may be present. We show that spatial autocorrelation and spatial heterogeneity are detected in the spatial distribution of HDI and ECI in São Paulo Municipality, and therefore intra-urban inequalities exist with respect to both urban indicators. The development level varies substantially across districts, and center and periphery are the most obvious spatial regimes characterizing this variation. The ESDA methods described in this study can be adopted by planners to examine different variables, leading to more reliable results based on statistical tests and revealing, more precisely, locations that require more/less attention.

5.1 Introduction

Urban indicators can guide planners when working in urban areas characterized by heterogeneous spatial patterns, which are often related to population distribution. These spatial patterns can be explained by a variety of factors, including ethnicity, race, and socioeconomic attributes. In developing countries, in particular, urban heterogeneity tends to be associated with intra-urban inequality. When urban governments seek ways to reduce this inequality, analytical techniques can be used to assist policy making. In this chapter we use spatial analysis techniques to assess

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intra-urban inequality based on urban indicators. Such assessments can serve as useful decision-making guides, especially when “pro-equality” forces dominate urban agendas.

We rely on two urban indicators as measures of intra-urban inequality: the Human Development Index (HDI), devised by the United Nations Development Program (UNDP), and the Economic Concentration Index (ECI), proposed in this study. Table 5.1 describes the components of these indicators. The HDI – a widely accepted measure of human development – summarizes a number of dimensions: (1) education, which is represented by adult literacy rate and gross enrollment ratio; (2) longevity, which is represented by life expectancy at birth; and (3) income, which is represented by Gross Domestic Product (GDP) per capita (PPP US\$), an established measure of economic strength.

Using the same methodology as the HDI, we create the ECI, which reflects three dimensions of economic development: (1) fiscal revenues, calculated using total property and service taxes divided by the total population; (2) productivity, calculated using total income divided by total population; and (3) employment, calculated using total number of employees in all formal sectors of the economy divided by the total labor force (people between the ages of 15 and 64). The explanation for our choice of indicators to assess intra-urban inequality follows.

It is well documented that in developing countries the “differential in wealth . . . and its associated problems are increasingly more visible and . . . more intense in urban settlements. A large – or rather the largest – number of rich and poor people are physically concentrated in relatively small geographical areas” (Werna, 2000, p. 2). Brazilian cities exemplify the spatial distribution of rich and poor people and the heterogeneous spatial patterns described above. *Favelas* – Brazilian slum areas – and expensive condominiums are adjacent to each other in many metropolitan regions in the country. The income variable, which is probably the major determinant of intra-urban inequality in Brazilian cities, is also manifested in differential provision of and access to infrastructure (Lima, 2001). Extending efforts to overcome the dominance of economic variables – income in particular – in understanding intra-urban inequalities, we subscribe to a broader view of development based

Table 5.1 Urban indicators and their components

Urban Indicator	Dimension	Variable
Human Development Index	Longevity	Life expectancy at birth
	Education	Adult literacy rate Gross enrollment ratio
	Income	Gross Domestic Product per capita
Economic Concentration Index	Fiscal revenue	Total property and services taxes per capita
	Productivity	Total income per capita
	Employment	Total number of employees in all formal sectors of the economy divided by the total labor force

on the human development paradigm. This paradigm, introduced by Haq (1998), is defined by four essential components: equity, sustainability, productivity, and empowerment. In addition to income, the human development paradigm focuses on social, cultural and political factors, and it has in the HDI the most popular way of spreading its beliefs.

We define intra-urban inequality as the variation in development between districts of a given municipality. By considering the context of intra-urban inequalities in developing countries, this chapter focuses on examining levels of human and economic development and their spatial distribution across districts in a municipality of high overall economic affluence. To achieve this objective we use Exploratory Spatial Data Analysis (ESDA) methods. In the following section of this chapter we review the theoretical work and empirical studies on intra-urban inequalities. We then introduce our conceptual framework, describe the study area – São Paulo Municipality – and the data used in the analyses. We then present the application of ESDA methods, which constitutes our empirical work, and summarize the findings of the spatial analyses. Finally, we highlight the importance of this methodology to planners.

5.2 Literature Review

5.2.1 Human and Economic Development

Human development is an important aspect of the overall development of urban areas. Knowing that education and health exert influence on the generation of economic growth (Anand & Sen, 2000), human development, which encompasses both, has an obvious role to play in the promotion of economic growth. Therefore, if a district is lagging in development relative to a municipal level, improving its human development level may also contribute to its overall development. In the same vein, Ranis, Stewart, & Ramirez (2000) agree and highlight the need to direct attention to human development in the economic development process. The authors emphasize a strong connection and a two-way linkage between human development and economic growth. They recommend that human development should always be considered along with economic growth in the development process.

Regardless of this close association between human and economic development, the two phenomena have been treated and measured independently. Alkire (2002), however, identifies aspects of development, such as human capital and health, for which GDP by itself is an inadequate proxy. This recognition of the limited utility of GDP alone as a measure of overall development, has led researchers in the field of development economics to attempt to elaborate on the measures of economic development, the HDI being one example of these efforts. Therefore, this study uses the HDI and the newly devised ECI to better understand intra-urban inequalities with respect to development.

5.2.2 Empirical Studies on Intra-Urban Inequalities in Developing Countries

A number of research studies have explored the nature of intra-urban inequalities. These studies relate the inequalities to the impacts of globalization processes, the effects of the implementation of neoliberal economic policies that advocate a smaller public sector, and to other macroeconomic initiatives (Burgess, Carmona, & Kolstee, 1997; Musterd & Osterndorf, 1998; Andersen & van Kempen, 2001; Marcuse & van Kempen, 2000, 2002). The studies include numerous urban indicators and often analyze them over several periods of time. For example, Ribeiro & Telles (2000) examine the Rio de Janeiro (Brazil) metropolitan area to assess the heterogeneity of its spatial patterns based on variables such as per capita income, illiteracy, black and mixed-race population, employment by sector, and employment by position.

A number of researchers have used São Paulo Municipality (SPM) for their study site in exploring the nature of intra-urban inequalities (Schiffer, 2002; Torres & Gomes, 2002; Torres & Marques, 2004). For instance, Sposati (1996, 2000) proposes a new index – the Social Exclusion/Inclusion Index (EIX) – that uses 47 variables, which can be aggregated into 17 different EIXs. She develops the Social Exclusion/Inclusion Map for SPM with the objective of identifying districts that are in need of social assistance. The spatial distribution of the EIXs and their visualization may help municipal policymakers to allocate investments in social programs across the SPM districts. Torres, Marques, Ferreira, & Bitar (2003) examine patterns of segregation in SPM using factor analysis that results in two indices: deprivation index and family cycle index. They map their results and state that the urban space of SPM is heterogeneous.

The majority of studies, however, are descriptive and rely primarily on maps, graphs, or tables to display data and their spatial distribution. Similarly, the studies that explore the heterogeneity of the spatial patterns in the SPM tend to ignore the spatial dimension. By introducing the spatial dimension we can overcome the limitations of analyses that do not take into account the dependency of the development level of each spatial unit on its geographic location. Spatial statistical analyses, and more sophisticated statistical tests that increase the reliability of findings, are rarely performed.

Exploratory Spatial Data Analysis (ESDA) has been applied previously but in different inequality contexts (Rey, 2004; Ertur & Le Gallo, 2003; Baumont, Ertur, & Le Gallo, 2004; Guillain, Le Gallo, & Boiteux-Orain, 2006; Le Gallo & Dall'Erba, 2006). For example, in terms of regional inequalities, Le Gallo & Ertur (2003) examine the regional per capita GDP among European regions. In the Brazilian context, Ramos (2002) presents the results of ESDA for the São Paulo metropolitan area, to show how the visualization and analyses of data can be useful in guiding decision-making processes. Câmara, Monteiro, Ramos, Sposati, & Koga (2004) also use ESDA in studying the SPM districts, mapping the variables of the Social Exclusion/Inclusion Index to understand the social dynamics within SPM.

Based on the review of empirical literature we find that spatial dimension and statistical analysis are only sporadically considered in the studies of intra-urban differences. Therefore, including the spatial dimension could be of great value for our better understanding of urban phenomena. In addition, application of statistical tests would allow for more reliable discovery and comprehension of spatial patterns in urban areas. Different from other studies, the methods applied in this chapter highlight locations within urban areas that may deserve more or less attention, depending on the issue being examined. This is possible because ESDA, among other tools, provides the possibility of exploring and visualizing clustering within a study area. The detection of clusters can be a great advantage for urban planners as it can help identify specific areas requiring intervention as well as areas that may serve as positive models to emulate.

5.3 Research Framework

The central element of the research framework (Fig. 5.1) is the development level and its spatial distribution, which combines “human development” and “economic development.” Human development is measured by the Human Development Index (HDI). Economic development is measured by the Economic Concentration Index (ECI), which is newly proposed in this study.

The combination of HDI and ECI is used to classify the municipal districts and provide a possible input to policymaking. The classification reveals either an unequal or equal pattern of development. In addition to the quantitative indicators of intra-urban inequality, the differentiation between and interpretation of the patterns depends on urban politics and the extent that “pro-equality” forces dominate urban agendas. Public discussion and scrutiny are important in distinguishing between these patterns.

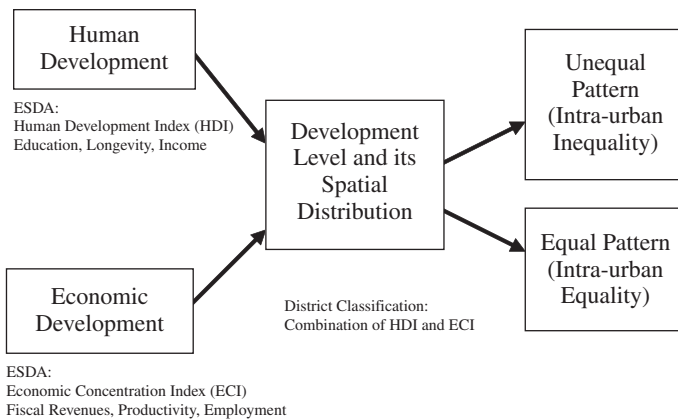


Fig. 5.1 Research framework

Within this context, in this chapter we pursue the following research question: What is the variation in development level and its spatial distribution across districts within an economically affluent municipality? To answer this question, we pose and test the following hypothesis regarding dependence of development on districts' location: If a district is located in an affluent municipality, then it has a high level of development and displays a uniform pattern in the spatial distribution of development (all areas are equally affluent in terms of both human and economic development). This hypothesis is posed assuming that economic growth generates income gains for the poor and promotes welfare benefits such as access to school and health care. The expected outcome of economic growth, therefore, is an increased level of human development across the population, and if our study area is considered economically affluent, this should be the case. However, some studies suggest this is not always the case. For instance, Devas et al. (2001) show through 10 case studies from cities in the Southern Hemisphere that "economic growth alone does not ensure access for all basic needs, and can in turn increase inequality" (p. 6). The application of Exploratory Spatial Data Analysis (ESDA) methods will help determine what the reality is in one of the major municipalities in Latin America and may provide a model for application to other urban areas around the world.

5.4 The Study Area

The analyses in this study are performed using data for São Paulo Municipality (SPM) disaggregated by administrative district. An analysis of regional inequalities with respect to development at the municipal level in Brazilian states indicates that SPM is well above other municipalities within the state of São Paulo (Haddad, 2003). That is not surprising given that SPM is the most affluent municipality in the country. However, we suspect that aggregated municipal development data may be masking the intra-urban variations that occur even inside well-off municipalities. As Portnov (2002) alerts, "... similarly to spatial disparities in regional development, intra-urban inequalities, once occurring, may become persistent and self-perpetuating" (p. 149). Therefore a change in the scale of analysis is applied to assess intra-urban inequalities.

São Paulo is one of 39 municipalities that make up the São Paulo metropolitan area, which is the largest metro area in Brazil. SPM has over 10.5 million inhabitants, representing 6% of the national population. In 2000, about 17% of the national GDP and 21% of the industrial domestic product were generated in São Paulo Municipality. SPM has a large public-sector presence, with about 150,000 public employees directly working for the municipal government and 50,000 additional employees working for other public-sector entities (Werna, 2000). The municipal government is decentralized into 31 *Sub-Prefeituras* (sub-municipalities).

5.5 Data

The unit of analysis for this study is an administrative district. The district level is the chosen unit of analysis for two main reasons: (1) the district is the basic areal unit for higher aggregations such as 31 *Sub-Prefeituras* (31 sub-municipalities), 13 *Núcleos de Educação* (13 Education Nuclei), and 39 *Distritos de Saúde* (39 Health Districts); and (2) all the data needed for the analyses are available at this level. In general, SPM administrative districts are highly populated because SPM is the central municipality of São Paulo metropolitan area, in terms of both geographic location and concentration of economic forces. Southern districts are less populated because of a major body of water, *Represa Billings*, located there, but as both indicators – HDI and ECI – control for population, the variation in density does not affect the validity of the analysis presented in this chapter.

The 2000 HDI for the 96 administrative districts in São Paulo Municipality was calculated by the *Secretaria Municipal do Desenvolvimento, Trabalho e Solidariedade* (SMDTS, 2002) using the same methodology as UNDP. The Secretariat's report states that "40% of the districts of the richest city in the country present low levels of human development" and "the HDI for SPM districts reach values that can be found in both Europe and Africa at the same time" (p. 12). The report also points out that "38 districts have very low HDI (below 0.5), thus forming poverty pockets across the municipality" (p. 4). The 2000 ECI is calculated by the author, using data acquired by the *Secretaria Municipal da Fazenda*.

Figure 5.2 shows the HDI relative to the districts' average in 2000. Districts with low human development, located in the east, north and south, are those with HDI less than 90% of the sample average. Districts with high human development, located in the center of the municipality, are those with HDI greater than 110% of the sample average. These data suggest substantial intra-urban inequalities and high variability of human development in SPM such that the hypothesis we are testing appears not to hold. Empirical studies as described above typically would present a map like the one that follows and this would be enough. However, we can explore this phenomenon much further, using ESDA tools to statistically test this variability and provide more robust results.

5.6 Spatial Weight Matrix

To conduct ESDA it is necessary to define a spatial weight matrix W . This matrix imposes a neighborhood structure on the data and can be defined in a variety of ways. By examining empirical works and focusing on the types of spatial weight matrices, the context in which they are used, and their applicability to this study (Anselin, 1995; Talen & Anselin, 1998; Pereira, Carreiras, & Vasconcelos, 1998; Messner et al., 1999; Baller, Anselin, Messner, Deane, & Hawkins, 2001; Baumont

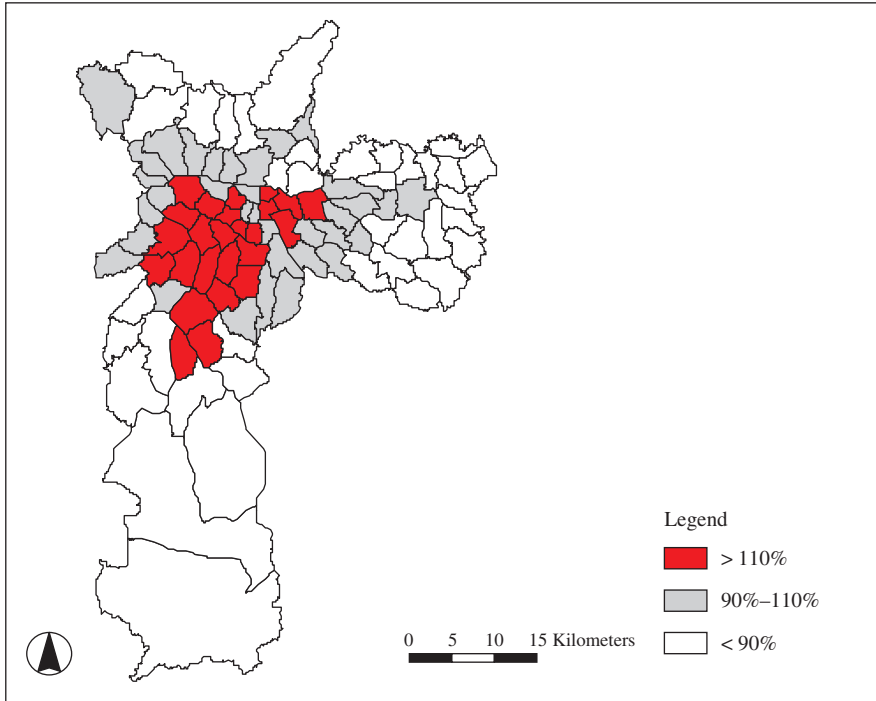


Fig. 5.2 HDI relative to the sample average of São Paulo municipality districts, 2000

et al., 2004; Ertur & Le Gallo, 2003), we opted for one simple binary queen contiguity and two k -nearest-neighbors matrices. We use three matrices in our analyses to test the robustness of our results.

The simple binary queen contiguity matrix is composed of 0 and 1: if district i has a common boundary and/or vertex with district j , then they are neighbors and $w_{ij} = 1$; if district i does not have a common boundary and/or vertex with district j , then they are not neighbors and $w_{ij} = 0$. The diagonal elements are set to 0. The k -nearest-neighbors weight matrix is defined as:

$$\begin{cases} w_{ij}^*(k) = 0 & \text{if } i = j \\ w_{ij}^*(k) = 1 & \text{if } d_{ij} \leq d_i(k) \text{ and } w_{ij}(k) = w_{ij}^*(k) / \sum_j w_{ij}^*(k) \\ w_{ij}^*(k) = 0 & \text{if } d_{ij} > d_i(k) \end{cases} \quad (5.1)$$

where $d_i(k)$ is a critical cut-off distance defined for each district i ; $d_i(k)$ is the k th order smallest distance between districts i and j such that each district i has exactly k neighbors. For this study, $k = 5$ and $k = 6$ are applied. These values are chosen because they represent the highest frequency in the distribution of connection between SPM districts, based on the examination of the simple binary queen

contiguity matrix; that is, the majority of SPM districts have five or six neighbors (22 and 23 districts, respectively). All matrices, the simple binary queen contiguity and two k -nearest-neighbors matrices, are row standardized so that each row sums up to 1.

5.7 Exploratory Spatial Data Analysis and Results

To better understand intra-urban inequalities and their relationship to development levels, we introduce the spatial dimension in our analyses. By introducing the spatial dimension we overcome the limitations of analyses that neglect to consider the dependency of each district's development level on its geographic location. To consider the geographic location of each district relative to other districts in a municipality, we apply some methods of Exploratory Spatial Data Analysis (ESDA). ESDA methods are used "to describe and visualize spatial distributions, identify atypical locations (spatial outliers), discover patterns of spatial association (spatial clusters), and suggest different spatial regimes and other forms of spatial instability or spatial non-stationary processes" (Anselin, 1998, p. 258). By using these methods we can identify spatial effects, which can be classified into two general types: spatial autocorrelation and spatial heterogeneity (Anselin, 1988).

Spatial autocorrelation occurs when value similarity and locational similarity coincide (Anselin, 2001). Positive spatial autocorrelation exists when high values correlate with high neighboring values and when low values correlate with low neighboring values. For example, districts with high (or low) HDI may be surrounded by districts with high (or low) HDI, and we may observe patterns of clustering in a study area. Negative spatial autocorrelation exists when high values correlate with low neighboring values, and vice versa, and no clustering pattern can be observed.

Spatial heterogeneity exists when structural changes related to location are detected in the data set, implying unstable relationships between values of observations, and detectable spatial regimes. These relationships are described by a multiplicity of functional forms and parameters that vary across the data set (Anselin, 1988). For example, districts located in the north of a study area may be clustered around low ECI values, and districts located in the south may be clustered around high ECI values. In this example, north and south are the spatial regimes characterizing the spatial distribution of ECI.

In this chapter we conduct spatial analysis following two steps: (1) use ESDA to assess the distribution of HDI and ECI in the year 2000; and (2) combine ESDA results for HDI and ECI to generate a District Classification Map for the year 2000. To accomplish these steps we use GeoDa (Anselin, 2003) software (available at <https://geoda.uiuc.edu/downloadin.php>). We also use SpaceStat (Anselin, 1992) and ArcView software. Two distinctive ESDA concepts are applied: global spatial autocorrelation and local spatial autocorrelation. Their descriptions and applications to the SPM districts are presented below.

5.8 Global Spatial Autocorrelation

Among statistics of global spatial autocorrelation, Moran’s I is widely used. It provides a formal indication of the degree of linear association between the observed values and the spatially weighted averages of neighboring values. Moran’s I shows if there is clustering in our data set, and is defined as:

$$I = \frac{n}{S_0} \cdot \frac{\sum_i \sum_j w_{ij} (x_i - \mu)(x_j - \mu)}{\sum (x_i - \mu)^2} \tag{5.2}$$

where x_i is the observation in district i ; μ is the mean of the observations across districts; n is the number of districts, and w_{ij} is one element of the spatial weight matrix W which expresses the spatial arrangement of the data. S_0 is a scaling factor equal to the sum of all elements of W . Values of I larger than the expected value $E(I) = -1/(n - 1)$ indicate positive spatial autocorrelation, whereas values of I smaller than the expected value $E(I) = -1/(n - 1)$ indicate negative spatial autocorrelation. Moran’s I values range from +1 (perfect positive spatial autocorrelation) to -1 (perfect negative spatial autocorrelation).

Table 5.2 displays the global Moran’s I statistics for the HDI and ECI in São Paulo Municipality administrative districts, using the three matrices described above. The null hypothesis of spatial randomness is rejected for the two urban indicators using the three different matrices, confirming the robustness of our results. All coefficients are statistically significant at the 0.001 level, based on the permutation approach with 999 random permutations. Permutations are part of a numerical approach to testing for statistical significance. The advantage of a numerical approach is that it is data-driven and makes no assumptions (such as normality) about the data. The disadvantage is that its p-values are dependent on the number of permutations (Anselin & Koschinsky, 2005). From Table 5.2 one can observe that the HDI and ECI distributions are characterized by a significant global positive spatial autocorrelation, which suggests that their values are spatially clustered. This means that the districts with high HDI/ECI are located close to districts with high HDI/ECI values, and the districts with low HDI/ECI are located close to districts with low HDI/ECI values. The standardized values of HDI/ECI are high and similar to each other.

Table 5.2 Moran’s I for HDI and ECI, 2000

Variable	Wk(6) weight matrix			Wk(5) weight matrix			W Binary weight matrix		
	Moran’s I	St. Dev.	St. Value	Moran’s I	St. Dev.	St. Value	Moran’s I	St. Dev.	St. Value
HDI	0.608	0.054	11.454	0.626	0.059	10.788	0.657	0.066	10.114
ECI	0.653	0.053	12.519	0.666	0.059	11.466	0.648	0.065	10.131

These results indicate that location plays an important role when examining these urban indicators at the global level, i.e., when the district value for the indicator is compared to the mean of the study area. We cannot talk about spatial randomness or lack of spatial dependence when focusing on these variables, and therefore we need to assess local spatial autocorrelation. In doing so, we will be able to identify the specific locations of the local clusters responsible for the clustering pattern detected by Moran's I .

5.9 Local Spatial Autocorrelation

The Moran Scatter Plot (Anselin, 1996), the Local Indicators of Spatial Association – LISA (Anselin, 1995), and the Getis-Ord statistics (Ord & Getis, 1995) are very useful techniques to assess local spatial autocorrelation. They reveal the structure of spatial autocorrelation within the municipality by identifying local clusters of high or low values and the districts that contribute most to global spatial autocorrelation. They also point to individual districts or a group of neighboring districts that deviate from the global pattern of spatial autocorrelation.

5.9.1 The Moran Scatter Plot

The Moran Scatter Plot depicts the spatial lag of the variable on the vertical axis, and the variable value at each district on the horizontal axis, facilitating the visualization of local spatial instability and outliers. Spatial lag is defined as the weighted average of neighboring values of a location. The Moran's I value is interpreted as a regression coefficient and is displayed as the slope of the line in the scatter plot, for a row-standardized weight matrix only. Anselin (1998) describes this scatter plot:

“When the variables are expressed in a standardized form (i.e., with mean zero and standard deviation equal to one), this allows for an assessment of both global spatial association (the slope of the line) as well as local spatial association (local trends in the scatter plot). The latter is obtained by the decomposition of the scatter plot into four quadrants, each corresponding to a different association: positive association between high values in the upper right [HH] and between low values in the lower left [LL] quadrants; negative association between high values surrounded by low values in the lower right [HL] and the reverse in the upper quadrant [LH]” (p. 261).

To illustrate this tool, we generate the scatter plots for HDI and ECI in 2000 by using the six-nearest-neighbors weight matrix (Fig. 5.3). For most districts, values for both urban indicators are located in quadrants high-high (HH) and low-low (LL)

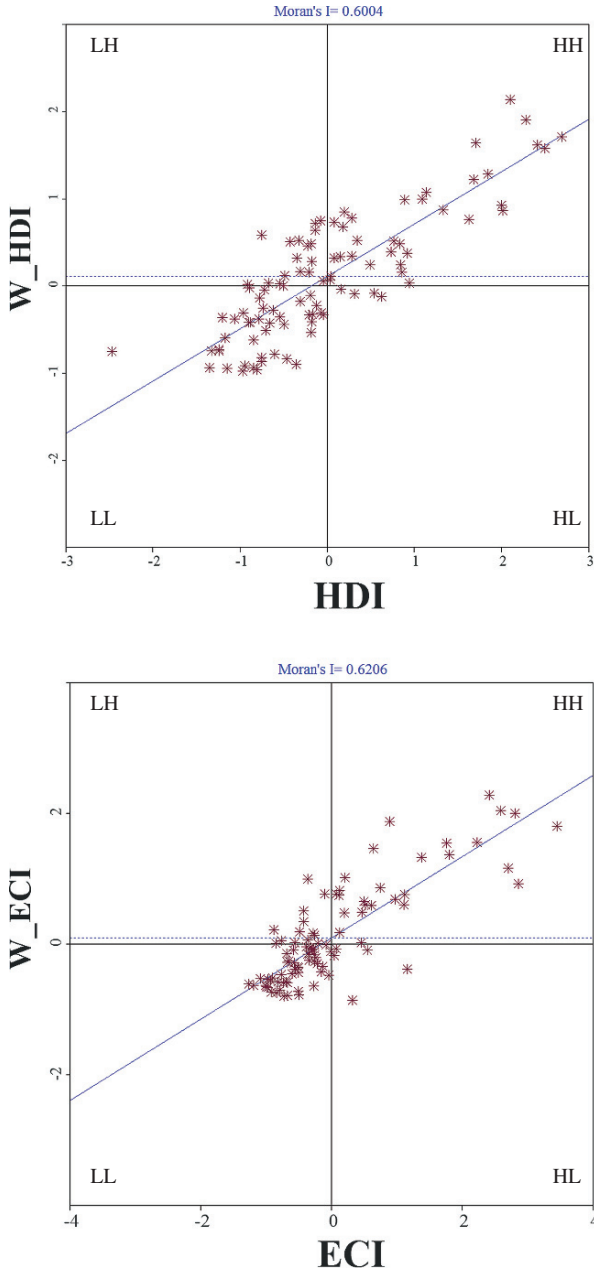


Fig. 5.3 Moran scatter plots for HDI and ECI, 2000

suggesting a positive spatial association. Seventy-eight percent of the SPM districts are located in HH and LL quadrants for HDI. Eighty-six percent of the SPM districts are located in HH and LL quadrants for ECI.

Using SpaceStat in conjunction with ArcView software it is possible to transform a scatter plot into a map, i.e., the Moran Scatter Plot Map (Fig. 5.4). The districts located in the HH quadrant in the plot are considered HH districts in the symbology of the map, and so on. One can observe in the maps – for both urban indicators – that the HH districts are located in the central part of SPM, and the LL districts are located in the periphery to the north, south, east and west. From Figs. 5.3 and 5.4 it is possible to identify the districts that deviate from the global pattern of positive spatial autocorrelation, which are represented by the points located in high-low (HL) or low-high (LH) quadrants. These districts – called spatial outliers – are located in the transitional zone between center and periphery.

The identification of these specific locations – center, periphery, etc. – is the starting point from which to explore spatial heterogeneity. By observing the maps, two spatial regimes may be detected for the HDI and ECI: the center (for HH) and the periphery (for LL). These maps confirm the center-periphery scheme that is usually observed in cities in developing countries. Schiffer (2002) describes these regimes when she states that, in SPM, the pattern developed after 1950 “preserved

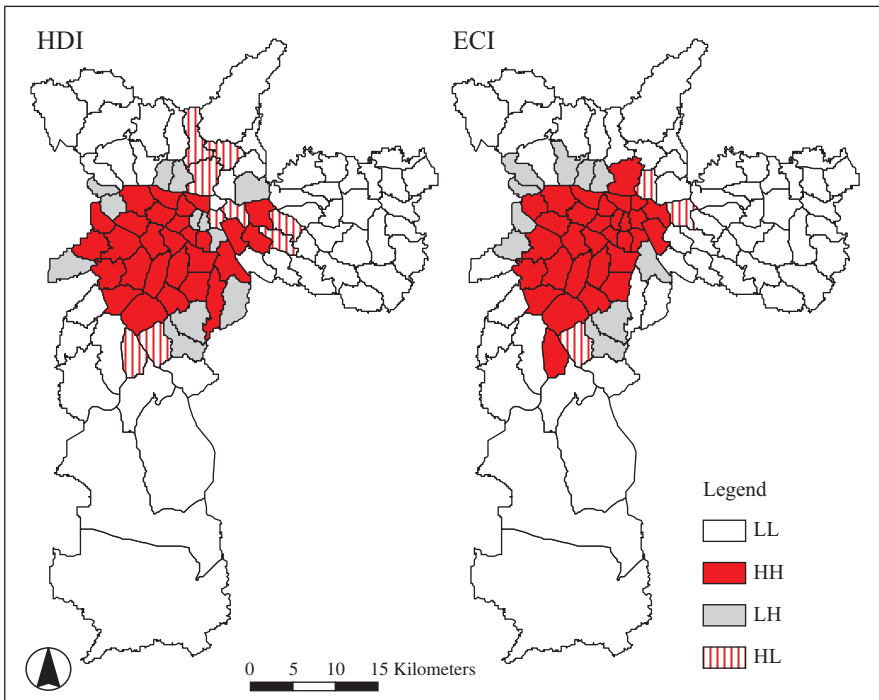


Fig. 5.4 Moran scatter plot maps for HDI and ECI, 2000

a radial form expanding out from the colonial nucleus, and characterized by the settling of lower-income groups in the outskirts of the city” (p. 143).

Knowing there exists a close association between human and economic development, policy makers may benefit if we combine the two phenomena. Therefore, to better guide policy makers, the Moran Scatter Plot Maps for HDI and for ECI are combined to generate the District Classification Map (Fig. 5.5). In this map we identify six categories of development of SPM districts in 2000 based on both HDI and ECI: developed, undeveloped, isolated-developed, isolated-undeveloped, dominant human development, and dominant economic development (Table 5.3). This map also confirms the center-periphery distribution. In addition to previously mentioned strong clustering of developed districts in the center and undeveloped districts in the periphery, the map reveals the location of isolated districts of development and underdevelopment as well as districts lacking balance between economic and human development. These last four categories are located in the transitional zone between center and periphery.

From the maps depicted above, we can identify different levels of development that lead to an unequal pattern, that is, intra-urban inequality. These tools, however, do not allow assessment of the statistical significance of HH, LL, HL, and LH spatial associations. LISA analyses address the tests for significance.

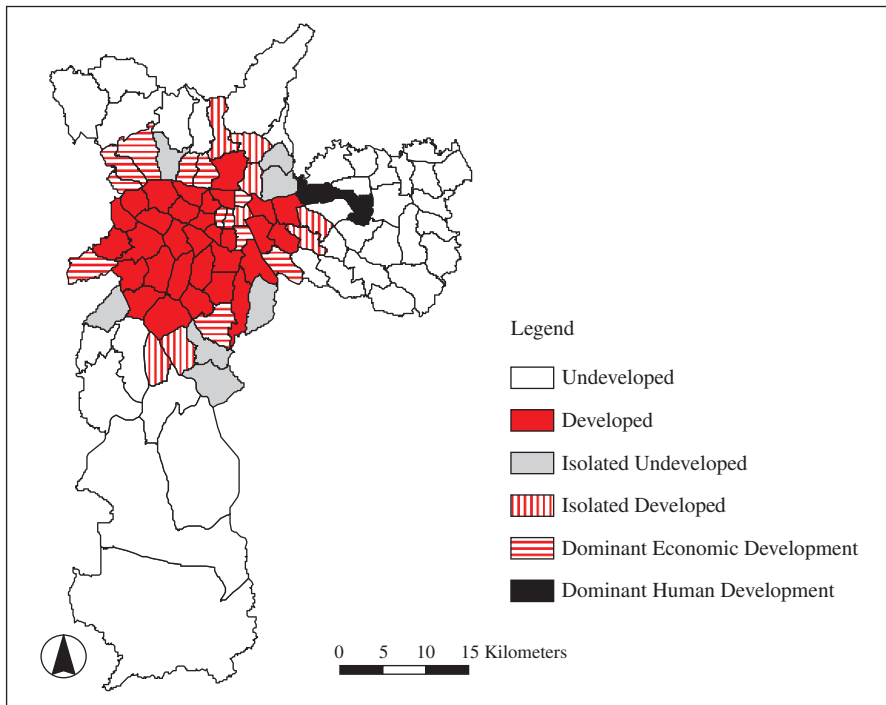


Fig. 5.5 District classification map

Table 5.3 Criteria for district classification

HDI	ECI	Group	Criterion	Classification
HH	HH	I	District with high HDI and high ECI surrounded by districts with high HDI and high ECI	Developed
LL	LL	II	District with low HDI and low ECI surrounded by districts with low HDI and low ECI	Undeveloped
HH	HL	III	District with high HDI and high ECI surrounded by districts with high/low HDI and high/low ECI	Isolated Developed
HL	HH			
HL	HL	IV	District with low HDI and low ECI surrounded by districts with high/low HDI and high/low ECI	Isolated Undeveloped
LH	LL			
LH	LH			
LL	LH	V	District with high HDI and low ECI surrounded by districts with high/low HDI and high/low ECI	Dominant Human Development
HH	LH			
HH	LL			
HL	LL			
HL	LH	VI	District with low HDI and high ECI surrounded by districts with high/low HDI and high/low ECI	Dominant Economic Development
LL	HL			
LL	HH			
LH	HH			
LH	HL			

5.9.2 Local Indicators of Spatial Association (LISA)

So far we have discovered that the spatial distribution of the urban indicators presents a positive spatial autocorrelation and some signs of spatial heterogeneity. Using LISA we can learn what specific locations contribute to the global pattern of spatial autocorrelation; i.e., we can identify the cores/centers of the clustering. The LISA for each observation give an indication of the extent of significant spatial clustering of similar values around that observation, providing a measure of the extent to which the arrangement of values around a specific location deviates from spatial randomness. LISA “allow for the decomposition of global indicators, such as Moran’s *I*, into the contribution of each observation” (Anselin, 1995, p. 94). The LISA are defined as:

$$I_i = \frac{(x_i - \mu)}{m_0} \sum_j w_{ij} (x_j - \mu) \quad \text{with } m_0 = \sum_i (x_i - \mu)^2 / n \quad (5.3)$$

where x_i is the observation in district i , μ is the mean of the observations across districts and the summation over j is such that only neighboring values of j are included. As Anselin (1995) describes, positive values of I_i indicate spatial clustering of *similar* values (either high or low), and negative values of I_i indicate spatial clustering of *dissimilar* values (for example, a location with high values surrounded by neighbors with low values).

LISA-based patterns are derived for HDI and ECI in year 2000, using the permutation approach and pseudo-significance level of 5%. Because LISA analysis is very sensitive to the level of significance used in its tests, we choose the p -value of 0.01 to calculate LISA. The results are presented in the LISA Cluster Maps (Fig. 5.6), using the six-nearest-neighbors matrix. The percentage of districts that present local positive spatial autocorrelation, following the global trend revealed by Moran's I , is about 25% for HDI and 18% for ECI. When using the six-nearest-neighbors matrix, no districts deviate from the global trend; i.e., LISA analyses reveal no districts with HL or LH values (or spatial outliers). Therefore, the local pattern is compatible with the global trend of positive spatial autocorrelation, with all districts that are significant in LISA being located in HH or LL quadrants of the scatter plot.

The map of the LISA cluster for HDI shows four obvious clusters: one HH in the center of the municipality, one LL located in the south, and two LL located in the east. Câmara et al. (2004) describe the south HDI “hotspot” as “an expansion area that has experienced an explosive growth in recent times, occupied by migrant

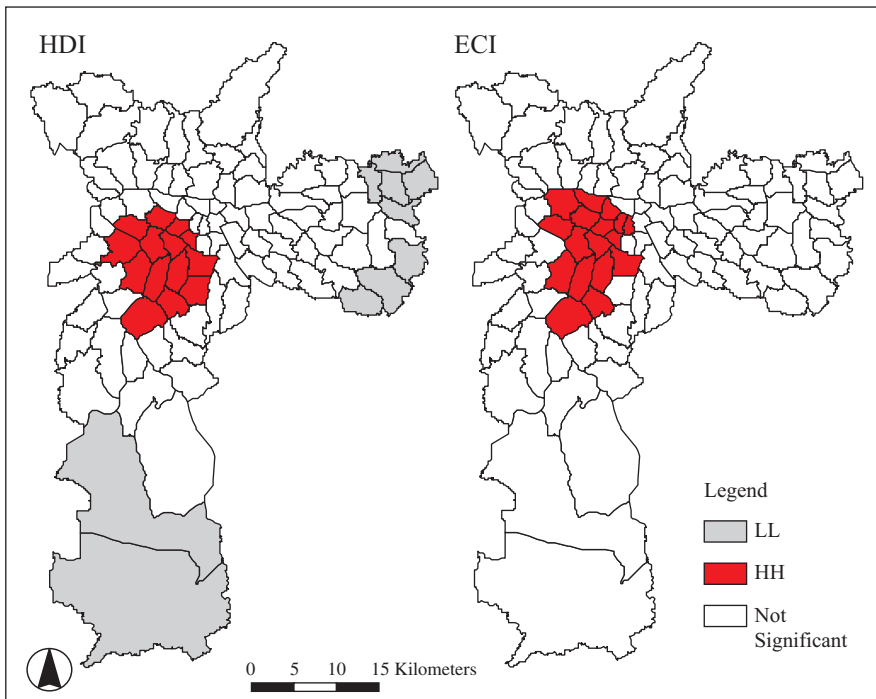


Fig. 5.6 LISA cluster maps for HDI and ECI, 2000

workers who come to São Paulo from other parts of the country” (p. 3). In the two eastern “hotspots” “the concentration of low-income population is a direct consequence of public policies of the 1970s and 1980s, that removed poor people from slums located in the central part of the city” (Câmara et al., 2004, p. 3). In the ECI map, only one HH cluster located in the center of the municipality is identified. These maps confirm the center-periphery pattern observed in the Moran Scatter Plot Maps.

We perform LISA analyses using all three weight matrices (binary, five and six neighbors), and our results show that similar numbers of districts are statistically significant. With only minimal differences, we confirm the robustness of the results. The LISA results confirm the presence of local spatial autocorrelation in many districts, reinforcing the presence of spatial heterogeneity translated in the center and periphery regimes.

5.9.3 Getis-Ord Statistics

To this point, we have discovered that the significant HH LISA belong to the center regime and the significant LL LISA belong to the periphery regime. But if we want to use all 96 districts in SPM to represent the spatial heterogeneity of our sample, how should we proceed? How can we define which districts belong to the center regime and which belong to the periphery regime? If we rely on the Moran Scatter Plots, the districts located in HL and LH quadrants must be dropped out of the sample. If we rely on LISA results, some spatial units – those that are not significant and those that are spatial outliers – will not be included in any of these regimes.

Following Le Gallo & Dall’Erba (2006), we use the Getis-Ord statistics to measure local spatial autocorrelation and to detect the spatial heterogeneity among all SPM districts. These statistics are calculated for every spatial unit and none can be dropped because of significance level or spatial outlier status, allowing the use of the whole sample. As Le Gallo & Ertur (2003) suggest, “these statistics are based on spatial accumulations and can thus help to deepen the analysis for detecting spatial clusters around each [district] i without being affected by the value taken by the variable in that [district] i ” (p. 178).

Getis-Ord statistics are calculated for each SPM district, and are defined as follows:

$$G_i^* = \frac{\sum_j w_{ij}x_j - W_i^*\bar{x}}{s \left\{ [(nS_{ii}^*) - W_i^{*2}] / (n-1) \right\}^2} \quad (5.4)$$

where w_{ij} is an element of the weight matrix W ; $W_i^* = \sum_{j \neq i} w_{ij} + w_{ii}$; n is the size of the sample; $S_{ii}^* = \sum_j w_{ij}^2$, \bar{x} and s^2 are the usual sample mean and variance.

A positive value for these statistics for district i indicates a spatial cluster of high values. A negative value for district i indicates a spatial cluster of low values. Based on the Getis-Ord statistics, the spatial distribution of HDI and ECI is

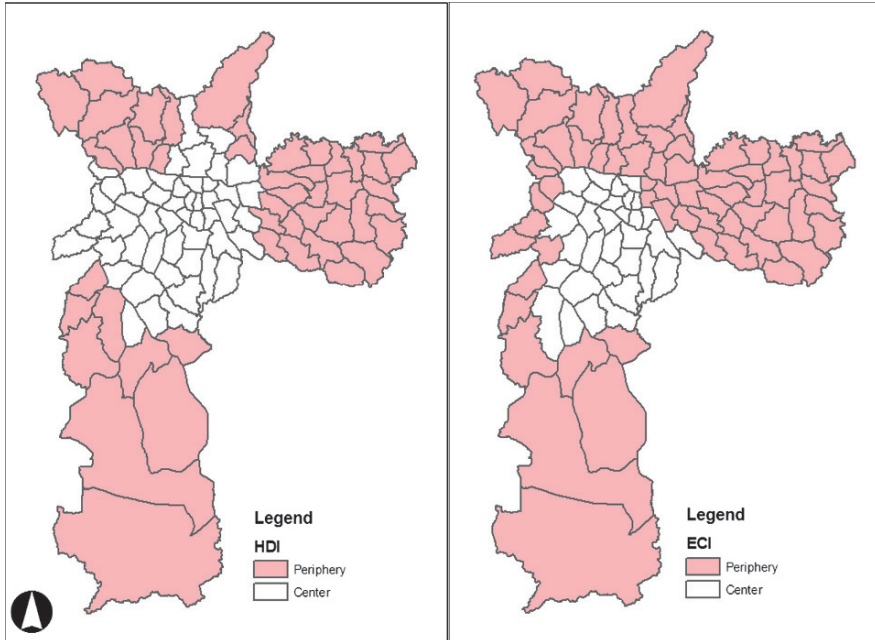


Fig. 5.7 Spatial regimes for HDI and ECI based on the Getis-Ord statistics

not stable across SPM districts and forms a characteristic spatial pattern of human and economic development displayed as center-periphery spatial regimes: a cluster of districts with positive Getis-Ord statistics (the center) for both urban indicators, and a cluster of districts with negative Getis-Ord statistics (the periphery) for both indicators. Figure 5.7 displays the center and periphery spatial regimes for HDI and ECI for all 96 districts. We can observe that there are some slight differences in the transitional zone between center and periphery. The center is larger in the HDI map, when compared to the ECI map. In other words, some districts that belong to the center regime – when using the HDI – are considered periphery, when using the ECI.

5.10 Discussion

The results of Exploratory Spatial Data Analysis (ESDA) indicate the presence of clustering (i.e., a positive spatial autocorrelation) and spatial heterogeneity in distributions of Human Development Index (HDI) and Economic Concentration Index (ECI) across the SPM districts. The analyses confirm the expected intra-urban inequalities with respect to human and economic development and the substantial variation in the levels of HDI and ECI across districts. The center-periphery scheme is the most obvious feature concerning this variation.

These results imply that the considerable economic growth and affluence of the richest Brazilian municipality are not sufficient to improve the human development status of its whole population and that the wealth is not well distributed. Therefore, we reject our hypothesis regarding dependence of development on districts' location. Our study shows that even if a district is located in an affluent municipality, unequal patterns of human and economic development can be detected. As suggested by the previous studies, economic growth alone does not ensure access to services, utilities and programs that are related to human development, and, consequently, further public intervention is needed to reduce these inequalities.

We offer two possible explanations of the discovered center-periphery scheme. First, in SPM it is not unusual to see “wealthy people influencing government officials to attract public investments and services to the neighborhoods they live in, at the expense of low-income neighborhoods” (Werna, 2000, p. 4). These wealthy people tend to live in the center of the municipality. Second, the inequalities in human development are also related to the “processes of political representation, [and] action rationale of the bureaucratic segments responsible for service provision” (Torres & Gomes, 2002, p. 16). Often, residents of the less developed districts lack adequate education and power to participate effectively in political processes.

If the SPM public sector is willing to achieve “pro-equality” goals, attention to spatially-oriented social policies is needed. The maps produced for this study highlight some districts that may be in greater need of public intervention, such as provision of social programs and basic infrastructure, and can certainly guide policy makers' intent on reducing intra-urban inequalities.

5.11 Conclusion

The methodology presented in this chapter can be adopted by planners worldwide to examine different variables, leading to more descriptive results based on statistical tests and revealing, more precisely, locations that may require more/less attention. In this Brazilian case study, the goal was to examine intra-urban inequality focusing on development level. Many other goals – inspired by a variety of urban and regional issues – can be addressed in the same way. Some examples are the analysis of housing markets, employment sectors, racial/ethnic profiles, and schools in need. If planners are dealing with a spatial problem, and spatial data are available, then ESDA methods can be applied.

These methods may help sharpen public policies that require the identification of specific locations. In the context of this study, suppose that certain social programs will be delivered for some districts of São Paulo Municipality. Knowing that the resources for these programs are scarce, the districts located in the periphery should benefit first, taking into account the findings of our analyses, and assuming that “equality” is ranked high on the public agenda. The ability to highlight specific locations in this manner makes ESDA a wonderful collection of tools to aid public planning and policymaking processes.

ESDA should not be the end of any spatial analysis, however, because its methods do not explain why the spatial patterns exist as they do. If spatial autocorrelation and spatial heterogeneity are present in the spatial distribution of the variables under examination, the next step should be the application of Confirmatory Spatial Data Analysis (CSDA). CSDA methods enable specification of spatially-explicit regression models that incorporate spatial autocorrelation and spatial heterogeneity. These methods help avoid misspecifications of models, inefficient coefficients, and erroneous statistical inferences that occur when spatial dependence and spatial heterogeneity are not addressed (Anselin & Rey, 1991). For example, using the HDI as the dependent variable, Haddad & Nedović-Budić (2006) apply CSDA methods in the 96 administrative districts of São Paulo Municipality. They examine the relationship between provision of public services and utilities and human development level, and verify if investments in social programs are allocated in districts that need them the most. Therefore, after exploring their own spatial data, planners should be able to determine the need to apply spatial regressions or traditional regressions to better understand the correlates of the phenomenon under assessment.

In this chapter we presented some of the available tools for ESDA. Many other possibilities – such as cross correlation and multivariate LISA – are available in GeoDa software allowing data exploration using multiple comparisons. The addition of new tools could expand the analyses presented in this chapter. However, we should be careful with the knowledge that can be acquired by using a variety of ESDA tools. We should combine the findings using a strict significance level (e.g., 0.01) to avoid misleading results.

The approach presented in this chapter has a few limitations. The elaboration of the District Classification Map is based on the Moran Scatter Plot, which does not test the significance of being located in HH, LL, HL or LH quadrants. Certainly, the District Classification Map can be an insightful source for planners, but it cannot be viewed as the complete picture. Instead, it should be taken as a good starting point to further explore locations. Second, in the same way the municipal aggregation masked intra-urban inequalities at the district level, we should consider a higher level of disaggregation to better understand what happens within the districts. Unfortunately, when we start to think “smaller,” we may face data availability problems.

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Chapter 6

Quality of Life and Cultural Diversity in Peel Region (Ontario, Canada)

Srimanta Mohanty

Abstract In the context of the socio-economic-health literature on quality of life, this study explores a theoretical synthesis for an analysis of Peel's experience based on secondary data sources. Peel is one of the fastest growing regions in Canada, with almost one million people. Within this rapidly growing region, a real-world social experiment is taking place. This experiment involves discovering how a tremendously diverse population, made up of people from all over the world, of different races and cultures, can live and prosper together in harmony. The study conducts a quantitative analysis of quality of life and cultural diversity in different neighborhoods in Peel with the help of mainly the Taxonomic Method and Mapping Technique. The study is useful for identifying indicators of spatial imbalances in socio-economic status with a view to setting up targets in allocating scarce resources. The study ends with a discussion of ways in which to better manage the rapidly changing face of the community in an effort to maintain or enhance the quality of life for the community.

6.1 Background

Information on cultural diversity within a population is important for the planning and delivery of services to that population. If citizens are going to make plans for their community, develop programs, and advocate for social and policy change, they must know about the quality of life of their community (e.g. characteristics of the population, culture, the economy, and the social infrastructure, etc.).

The present study extends itself to Peel, one of the fastest growing regions in Canada, with almost one million people. Peel is comprised of the Cities of Mississauga and Brampton, and the Town of Caledon. It is located west of the City of Toronto (Fig. 6.1). Unique social and natural amenities, cultural diversity combined with high living standards, make Peel North America's most livable region. People in Peel make up 8.7% of the Ontario population and 3.3% of the total Canadian

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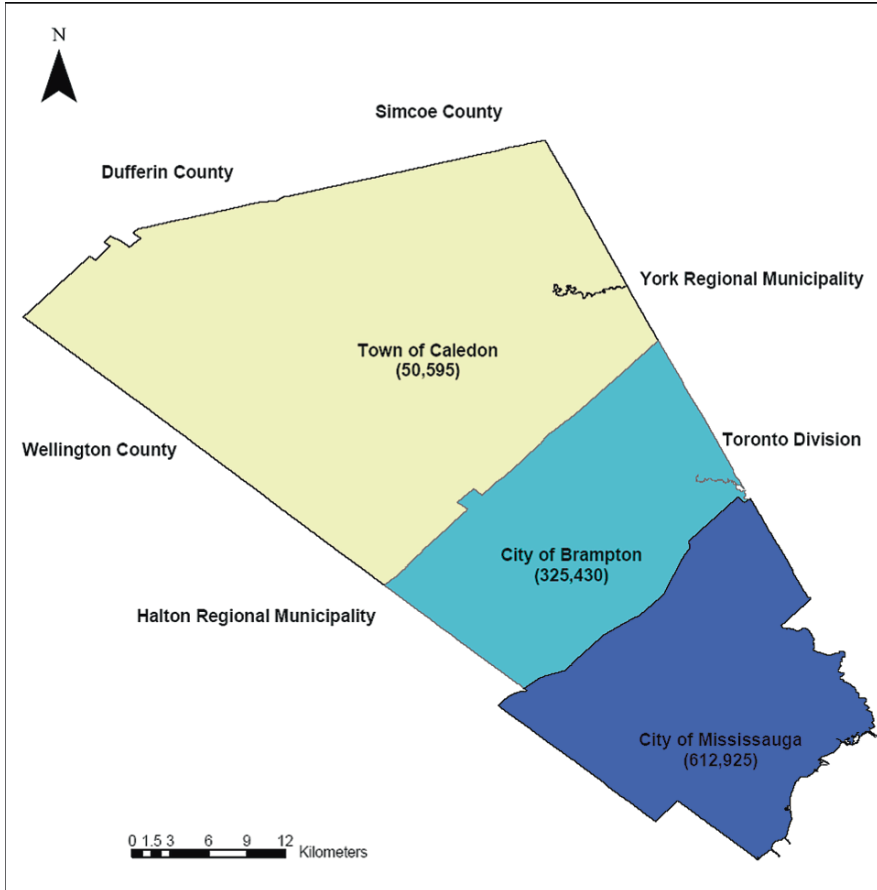


Fig. 6.1 Peel regional municipality [population (2001 Census): 988,950]

Source: Statistics Canada, 2001 Census. Produced by Srimanta Mohanty for the Social Planning Council of Peel, November 25, 2005

population. Peel is undergoing a real world social experiment. This experiment involves discovering how a tremendously diverse population, made up of people from all over the world, of different races and cultures, can live and prosper together in harmony (DeCoito & Williams, 2000).

Peel is the story of a rural region that has become largely urbanized over the past forty years. It is the story of a small county that is now one of the largest and fastest growing regions in Canada, home to the headquarters of many major national and international corporations in Canada. The story of Peel is also about a changing people. The White, pre-dominantly Christian people of early Peel have been joined by people from all over the world, people of different races and cultures, speaking over 60 different languages and practicing different religions. The engine of Peel's population growth is immigration. 62.6% of the growth of the Peel

population between 1996 and 2001 was due to immigration. Approximately 14% of Ontario’s immigrant population lives in Peel. Peel is home to many well-educated people, earning a relatively high annual income. Many of these people own their own homes, many of which are quite expensive. These are people who can take care of themselves, people with hope and plans for tomorrow. The rationale for selecting Peel is to study the levels of socio-economic status and cultural diversity and examine the neighborhood differences.

In Peel, fifteen neighborhoods were identified based on postal code areas/forward sortation areas (Fig. 6.2). Neighborhood refers to geographic districts in the municipalities of Mississauga, Brampton, and Caledon. These boundaries may

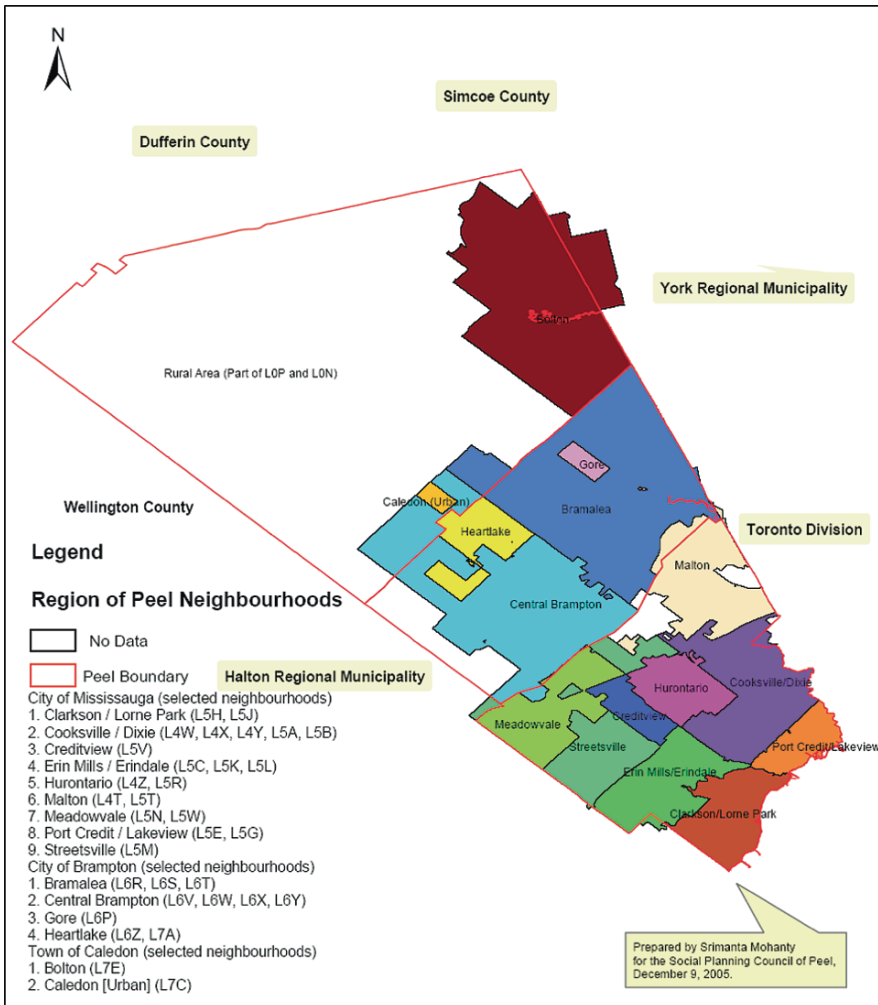


Fig. 6.2 Map of peel neighbourhoods, 2001
 Source: Statistics Canada, Census of Canada, 2001

Table 6.1 Population size and growth by region, 2001

Geographical area	Total population (#)	Population growth 1996–2001 (%)
Canada	30,007,090	4.0
Ontario	11,410,030	6.1
Peel	988,950	16.0
City of Mississauga	612,925	12.6
Clarkson/Lorne Park	46,375	0.5
Cooksville/Dixie	158,510	2.7
Creditview	37,135	71.9
Erin Mills/Erindale	94,955	1.2
Hurontario	62,460	18.4
Malton	41,165	5.2
Meadowvale	84,225	34.2
Port Credit/Lakeview	32,465	2.1
Streetsville	55,600	33.2
City of Brampton	325,430	21.3
Bramalea	129,020	23.0
Central Brampton	154,755	17.7
Gore	2,250	Not available
Heartlake	38,990	24.1
Town of Caledon	50,595	26.8
Bolton	25,800	44.8
Caledon (Urban)	2,715	132.1

not represent the “natural” boundaries identified by residents, community groups and service providers. They were chosen based on a combination of “natural” boundaries and practical limits on manipulating the available data. The 15 selected neighborhoods represent about 98% of the total population of Peel. A study has documented that the planning of services should be based on current and factual information about the community (DeCoito & Williams, 2004). According to Statistics Canada, Peel’s population grew by 16% compared to 6.1% in Ontario, and 4% in Canada between 1996 and 2001 (Table 6.1). Of Peel’s three municipalities, the Town of Caledon showed the highest rate of population growth (26.8%), followed by Brampton with 21.3% and Mississauga with 12.6%. At the neighborhood level, the three fastest growing neighborhoods are: Caledon (Urban) (132.1%), Creditview (71.9%) and Bolton (44.8%). The three slowest growing neighborhoods in Peel are all in Mississauga: Port Credit/Lakeview (2.1%); Erin Mills (1.2%), and Clarkson/Lorne Park (0.5%).

This study provides a good look at how a community can be aided in better managing the rapidly changing face of their community in an effort to maintain or enhance the quality of life for the community.

6.2 Objectives

The present study provides a scientific understanding of the quality of life in Peel. However, the specific objectives of the study are as follows:

- To examine the different socio-economic, health and environmental aspects of the population of Peel;
- To assess the level of socio-economic status and cultural diversity in different neighborhoods of Peel by using taxonomic method;
- To explore the relationship between cultural diversity and socio-economic status in Peel neighborhoods by using mapping technique; and
- To identify “model” neighborhoods and set potential targets for the socio-economic indicators for a less developed neighborhood (for example: Cooksville/Dixie) in Peel by using the taxonomic method.

6.3 Conceptual Framework

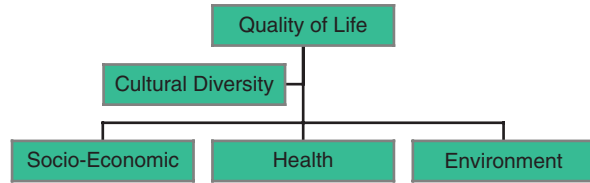
The quality of life in the development process has always remained an issue of concern among researchers, academicians and policy makers. The International Society for Quality of Life is a useful source of information on this topic. Various conceptual frameworks have been developed for understanding the quality of life approaches: UN Human Development Index (1990); The Economist: Quality-of-life index (2005); Physical quality-of-life index (1979); UN Human Development Index (1990); Genuine Progress Indicator (1980); Gross National Happiness (1972), etc. For more details about the quality of life approaches, please visit at http://en.wikipedia.org/wiki/Quality_of_life.

There are many components of quality of life. The quality of life is a product of the interplay among the social, health, economic and environmental conditions that affect human and social development (Shookner, 1999). The Quality of Life Index (QLI) provides a tool for community development that can be used to monitor key indicators that encompass the social, health, environmental and economic dimensions of the quality of life. The QLI can be used to comment frequently on key issues that affect people and contribute to the public debate about how to improve the quality of life in the communities.

6.3.1 Proposed Conceptual Framework for Quality of Life in Peel

By integrating various quality of life approaches, the proposed framework (see Fig. 6.3) intends to provide a holistic analysis of quality of life in Peel. The Quality of Life is a function of “cultural diversity” and “socio-economic-environmental” factors. Cultural diversity refers to different systems of values, beliefs, customs and languages used by different groups of human beings to be in the world and to relate to the world and each other” (DeCoito & Williams, 2004). There are over 93 distinct ethnic groups in Peel and over 60 different languages spoken by Peel residents. The engine of Peel’s population growth is immigration. So the framework identifies mainly four dimensions of quality of life such as socio-economic, health, environment and cultural diversity. The aim of the framework is to achieve best

Fig. 6.3 Conceptual framework



quality of life by Peel residents. It examines the level of socio-economic status and cultural diversity in different neighborhoods in Peel. This framework can be useful for researchers, policy makers, development planners, and program implementers.

6.3.2 Description of Variables (Indicators) and Quality-of-Life Dimensions

Quality of life is a multidimensional concept comprising of essentially four dimensions, socio-economic, health, environment and cultural diversity. Because of the lack of reliable data, we restrict our analysis to the early 2001. Indicators selected for this study are based on availability of data, importance/priority and quality. For more details definitions of the selected indicators, please see the technical notes. Quality of life in Peel will be studied on the basis of the following indicators:

Socio-Economic Dimensions

- Percentage of persons aged 20 years and over with less than Grade 9 education, 2001
- Percentage of persons aged 20 years and over with Bachelor's Degree and higher education, 2001
- Labor force participation rate aged 15 years and over (%), 2001
- Unemployment rate aged 15 years and over (%), 2001
- Average family income (\$), 2000
- Incidence of low income families (%), 2000
- Owned dwellings (%), 2001

Health Dimensions

- Self-rated health (Proportion of the population aged 12 and over who rate their own health status as being either excellent or very good)
- Infant mortality rate (Rate per 1,000 live births), 2000
- Life expectancy at birth (years), 2000
- Low birth weight rate (Rate per 100 live births), 2001
- Suicide rate (Rate per 100,000), 1999
- Causes of hospitalization – Top 3 for Men, 2000
- Causes of hospitalization – Top 3 for Women, 2000

Environmental Dimension

- Physical environment – Air Quality and Water Quality, 1990–2000

Cultural Diversity Dimensions

- Immigrants as a percentage of total population, 2001
- Visible minority population as a percentage of total population, 2001
- People speaking non-official languages as a percentage of total population, 2001
- Religion reported as percentage of total population, 2001

Table 6.2 shows the selected quality of life indicators of top five diverse counties in Canada. Peel is the second largest diverse municipality in Canada after Toronto. *Please note that data for health and environment by Peel neighborhoods were not available. So we restrict our analysis to “socio-economic dimension” and “cultural diversity dimension” at the neighborhood level.*

6.3.3 Hypotheses

This chapter attempts to study the effect of cultural diversity on quality of life in Peel neighborhoods and to test the hypothesis that there appears to be a strong relationship between cultural diversity and quality of life of the residents at the neighborhood level. The cultural diversity has an impact on quality of life of the residents at the neighborhood level. In this study, we have to take two assumptions:

- Higher (or lower) the value of socio-economic index (SEI), lower (or higher) is the level of socio-economic status; and
- Higher (or lower) the percentage of cultural diversity indicators (e.g. immigrants or visible minorities or persons speaking non-official languages or religion reported), higher (or lower) is the level of cultural diversity.

6.3.4 Sources of Data

The study focuses on the socio-economic, health, environment and cultural diversity in Peel. Data were collected from the following secondary data sources:

- Statistics Canada, Census of Canada, 2001.
- Statistics Canada, Canadian Community Health Survey, 2005.
- Social Planning Council of Peel, Planning Reports, 2004 & 2005.
- Regional Municipality of Peel, Health Status & Environmental Reports, 2001–2005.

6.4 Methodology

Measuring quality of life is a complex task. Two ways of assessing social well-being and its changes have been suggested. “One is to measure the constituents of well-

Table 6.2 Selected quality of life indicators of top five diverse regions in Canada

	Cultural diversity dimension		Socio-economic dimension				Health dimension	
	Immigrant (%), 2001	Visible minorities (%), 2001	Less than grade 9 (%), 2001	Bachelor's degree + (%), 2001	Labour force participation rate (%), 2001	Un-employment rate (%), 2001		Average family income (\$), 2000
Top five diverse regions/countries in Canada							Self-rated health*, 2005	
Communauté-Urbaine-de-Montréal (Que.)	27.6	21.1	14.7	23.1	62.8	9.2	62,409	59.0
Greater Vancouver Regional District (B.C.)	37.5	36.9	6.7	22.5	66.2	7.2	70,196	56.8
Peel Regional Municipality (Ont.)	43.1	38.5	7.6	20.7	73.5	5.1	79,324	61.0
Toronto Division (Ont.)	49.4	42.8	10.8	27.2	65.3	7.0	76,082	60.5
York Regional Municipality (Ont.)	39.1	29.8	8.3	25.2	71.3	4.5	91,757	63.9

NOTES: *Proportion of the population aged 12 and over who rate their own health status as being either excellent or very good (Data derived by Health Region/Unit); Data on environment provided later.

being (utility, freedoms etc.), and the other is to value commodity determinants of well-being (goods and services which are inputs in the production of well-being). The former procedure measures “output” (e.g. indices of health) and the latter evaluates and aggregates “inputs” (e.g. real national income)” (Das Gupta, 1993, Chapter 4, p. 75). Quantitative indicators are initial guideposts for development planning. The primary focus is on levels and quantitative measures of quality of life in Peel neighborhoods.

Several attempts have been made to develop better indices to macro-economic variables. Bernet (1951) constructed the index of development to focus attention on international disparities. Das Gupta (1971) considered some of the indicators for classifying the various districts of India on a ranking basis and used discriminant analysis. Although these indices vary in their method of construction and scope, some of them enable us only to compare the levels of development of different regions. The taxonomic method enables us to construct a similar index. Quality of life in Peel will be studied on the basis of the socio-economic indicators for Peel residents by using the following methods.

6.4.1 Taxonomic Method

Taxonomic method will be used to determine the level of socioeconomic status and cultural diversity of each neighborhood of Peel. The taxonomic method, which was designed by a group of Polish mathematicians in 1952, enables the determination of homogeneous units in an n-dimensional space without having to employ statistical tools such as regression and variance. It was recommended in 1968 to the United Nation’s Educational Scientific Cultural Organization (U.N.E.S.C.O) as a tool for ranking, classifying and comparing countries by levels of development. More recently, the method has been applied successfully to measure the levels of development of developing and developed countries.

We chose this method because it is suited for ranking, comparing and classifying regions of a country by levels of development, standard of living, status or any other such aspect (Harbinson, Manubrick, & Resnick, 1970). Briefly stated, the steps involved in this method are given below:

Step 1. The data of “n” regions for “m” variables is represented as a matrix of order $n \times m$. x_{ij} , where $i = 1, 2, \dots, n$ and $j = 1, 2, \dots, m$.

$$\begin{bmatrix} x_{11} & x_{12} & \cdot & \cdot & x_{1m} \\ x_{21} & x_{22} & \cdot & \cdot & x_{2m} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ x_{n1} & x_{n2} & \cdot & \cdot & x_{nm} \end{bmatrix}$$

Step 2. The elements of x_{ij} are standardized using the formula

$$\frac{x_j - \bar{x}_j}{s_j},$$

where $j = 1, 2, m$
and

$$\bar{x}_j = \frac{1}{n} \sum_{i=1}^n x_{ij}$$

and

$$s_j = \left[\frac{1}{n} \sum_{i=1}^n (x_{ij} - \bar{x}_j)^2 \right]^{1/2}$$

to give the standardized data matrix, $i = 1, 2, \dots, n, j = 2, \dots, m$. The standardized value can be represented as

$$\begin{bmatrix} D_{11} & D_{12} & \cdot & \cdot & D_{1m} \\ D_{21} & D_{22} & \cdot & \cdot & D_{2m} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ D_{n1} & D_{n2} & \cdot & \cdot & D_{nm} \end{bmatrix}$$

where

$$D_{11} = \frac{x_{11} - \bar{x}_1}{s_1}, \quad D_{12} = \frac{x_{12} - \bar{x}_2}{s_2}, \quad \dots \quad D_{1m} = \frac{x_{1m} - \bar{x}_m}{s_m}$$

From the above standardized matrix, the next step is to get the difference or “distance” from each point to every other point (1, 2, ..., n) for each of the m variables, which results in another interim matrix:

$$\begin{bmatrix} D_{11} - D_{21} & D_{12} - D_{22} & \cdot & \cdot & D_{1m} - D_{2m} \\ D_{11} - D_{31} & D_{12} - D_{32} & \cdot & \cdot & D_{1m} - D_{3m} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ D_{n-1} - D_{n1} & D_{(n-1)2} - D_{n2} & \cdot & \cdot & D_{(n-1)m} - D_{nm} \end{bmatrix}$$

Step 3. The distance between points P_a and P_b for any set or subset of m variables is derived by the following formula:

$$c_{ab} = \left[\sum_{k=1}^m (D_{ak} - D_{bk})^2 \right]^{1/2}$$

where the following relationships are apparent:

$$c_{aa} = 0; \quad c_{aa} = c_{ab}; \quad \text{and} \quad c_{ab} \leq c_{ak} + c_{kb}$$

The symmetric matrix is given by

$$C = \begin{bmatrix} 0 & c_{12} & \dots & c_{1n} \\ c_{21} & 0 & \dots & c_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ c_{n1} & c_{n2} & \dots & 0 \end{bmatrix}$$

Within a given set of neighborhoods, this distance of each neighborhood to every other is a synthetic or composite distance. In other words, it is mathematical expression of several distances on each of several dimensions with which neighborhoods can be compared. In each row there will be one point with the shortest or minimum distance. The critical minimum (or model) distance (C.M.D) and critical value (C.V) are derived as follows:

- i. Critical Minimum Distance (C.M.D) = $c_{(+)}$ = $\bar{c} + 2s_c$ where $\bar{c} = \frac{1}{n} \sum_{j=1}^n c_j$ is the arithmetic mean of the distances c_j (the minimum in each row of the distance matrix), and $s_c = \left[\frac{1}{n} \sum_{j=1}^n (c_j - \bar{c})^2 \right]^{1/2}$ is the standard deviation of the minimum distances in each row.
- ii. Critical Value (C.V.) = $c_{(-)}$ = $\bar{c} - 2s_c$

Step 4. The pattern of the development (c_{io}) is simply the distance of each neighborhood in the matrix to the ideal neighborhood (0) as derived by the following formula:

$$c_{io} = \left[\sum_{k=1}^m (D_{ik} - D_{ok})^2 \right]^{1/2}$$

where $i = 1, 2, \dots, n$ and 0 is the maximum standardized value as determined from the standardized matrix. The larger is this number (c_{io}) the greater is the distance from this particular neighborhood to its potential high point within the set or subset.

Step 5. The measure of socio-economic status is a function of the pattern of socio-economic status and the “critical distance” from the so-called “ideal/model” neighborhood. The measure of socio-economic status is given by

$$d_i = \frac{c_{io}}{c_0},$$

where $c_0 = \bar{c}_{io} + 2s_{io}$ and $c_{io} = \frac{1}{n} \sum_{i=1}^n c_{io}$ (the mean of the pattern of socio-economic status), and

$$s_{io} = \left[\frac{1}{n} \sum_{i=1}^n (c_{i0} - c_{i0})^2 \right]^{1/2}$$

The measurement of socio-economic status is always non-negative. It can exceed 1, but the probability of such an event is small, so that in the majority cases, the following inequality holds: $0 < d < 1$. The closer *Socio-economic Index (SEI)* is to “0” the more developed is the neighborhood, and closer to “1”, the less developed is the neighborhood. Similarly, the closer *Cultural Diversity Index (CDI)* is to “0”, the greater the cultural diversity in the neighborhood, and the closer to “1”, the lower the cultural diversity in the neighborhood.

The above mathematical representation of the taxonomic method may be explained as follows.

At the outset, selected indicators of socio-economic status of neighborhoods are arranged in a matrix form. It is important to classify the selected indicators those, which promote and those, which retard development.

Since the taxonomic method, like many others, aims at constructing a unitary index of development, it is necessary to add up, at an appropriate stage, the value of all selected indicators. But since the original values of the different indicators are likely to be in different units, they cannot be pooled as such. For example, educational level is expressed as percentage; average income is expressed as Canadian dollars. It is, therefore, necessary to convert the original values of the indicator, into some standardized values. These standardized values of the selected indicators are arranged in another matrix.

The next step involved is to find out the “distance” from each neighborhood to another neighborhood for each of the standardized values of the selected indicators. Thereafter, it is necessary to convert several distances of each neighborhood into one single mathematical expression so that it would be easy to compare all the neighborhoods. When the values thus obtained are arranged in a matrix form, we get a systematic distance matrix.

The first row in the distance matrix represents the composite distances between first neighborhood and every other neighborhood. In each row, there will be one neighborhood with the shortest or the minimum distances to the corresponding neighborhood. The former, neighborhood is called the primary “model” of the later and the latter, the “shadow” of the former. One can hypothesize a situation when in one row there may be two or more neighborhoods with the same shortest or the same minimum distance to corresponding neighborhood in that row. However, the probability of such situation arising is virtually zero. Therefore, one can assume that there will always be only one neighborhood with shortest distance in each row.

The next step that follows in this process is to find out the “pattern” and measure of development of each neighborhood. First, it is necessary to create an ideal neighborhood by taking highest or best standardized values of the indicators of the socio-economic status of the groups under considerations. The simulated ideal neighborhood should obviously consist of the highest values of positive indicators and the lowest value of the negative indicators of the development of the group of

neighborhoods under consideration. It is unlikely that only one neighborhood in the group will have the highest or lowest value of the indicators. Therefore, a model neighborhood is simulated from a group of neighborhoods.

The distances between ideal neighborhoods and every neighborhood in the matrix for each standardized value of selected indicators are calculated. These distances are then arranged in another matrix, from which we can find out the pattern and measurement of development of each neighborhood. The pattern of socio-economic status is simply the composite distance from the ideal neighborhoods to other neighborhoods and the measure of socio-economic status is a function of the pattern of socio-economic status and critical distances from the simulated ideal neighborhood. These are derived by the formula discussed earlier.

In addition to facilitating the ranking of neighborhoods by levels of socio-economic status, the pattern and measure of socio-economic status are useful in identifying neighborhoods, which serve as the “model” for the socio-economic and fixing a target for a given neighborhood. Suppose we wish to find out “model” neighborhoods for the socio-economic status and fixing targets for neighborhood “M”. The “model” neighborhood for M should fulfill two conditions: its measures of socio-economic status should be higher than that of M, and the distance between M and its model neighborhoods should not exceed critical minimum distance. When one of the model neighborhoods is identified, the arithmetic means of the original values of their indicators serve as one single model neighborhood for the socio-economic status and fixing targets for the neighborhood M.

6.4.2 Mapping Technique

Mapping Technique uses the power of geography to make data come alive. It can assist in gaining new insights from data that simple cross-tab analysis cannot provide. Mapping technique will be used to explore the relationship between cultural diversity and socio-economic status.

6.5 Findings and Discussion

Problems begin when we try to compare two or more regions on the basis of quality of life. It is possible that one region is superior in one dimension and another region is superior in another dimension. The primary emphasis should be to make intra and inter-regional comparisons to help plan for the reduction of imbalances in quality of life. This section focuses on two types of analysis: (a) macro (Regional & Municipality) level and (b) micro-level (Neighborhood) level (by using Taxonomic Method).

6.5.1 Macro (Regional and City) Level Analysis

This section focuses on the quality of life in Peel at the regional and municipality level. It is also provided a comparative perspective of Peel in relation to Ontario

and Canada as a whole. Data for this study were collected from existing secondary sources like census, special surveys, and other government reports. According to the data availability, the different indicators of quality of life were selected for Peel. The selected indicators would demonstrate how well we are doing in terms of quality of life at the regional and city level.

6.5.1.1 Socio-Economic Status in Peel

Table 6.3 presents the socio-economic status indicators in Peel, Ontario, and Canada. Compared to Canada and Ontario as a whole, Peel has a lower proportion of people with less than a grade nine level of education [Peel (7.6%), Canada (10.5%), and Ontario (8.7%)]. Among the three municipalities, Brampton has the highest percentage of persons with less than a grade nine level of education (8.3%) compared to Mississauga with 7.4% and Caledon with only 5.7%. Compared to Canada and Ontario as a whole, Peel has a higher proportion of university-educated people within its population [Peel (20.7%), Canada (16.9%), and Ontario (19.2%)]. Among the three municipalities, Mississauga has the highest percentage of persons with at least a university degree (24.1%) compared to Caledon with 17.3% and Brampton with 14.7%.

It can be seen from Table 6.3 that Peel has a higher percentage of its age 15+ population in the labor force, compared to Ontario, and Canada. Peel has a lower unemployment rate than Ontario and Canada. Among the three municipalities, the highest unemployment rate was in Mississauga (5.3%), while the lowest was in Caledon (3.3%).

According to the 2001 Census of Canada, the average family income in Peel is higher than that in Ontario, and Canada [Peel (\$79,325), Canada (\$66,160) and Ontario (\$73,849)]. Among the three municipalities, Caledon has the highest average family income: \$98,325, followed by Mississauga, at \$80,381, and Brampton, at \$74,263. Peel, compared to Ontario and Canada, has a much lower percentage of families on low incomes. In 2000, less than 12% of the Peel population lived on low incomes/below the poverty line, compared to 14.4% in Ontario and 16.2% in Canada. Among the three Peel municipalities, Mississauga has the highest percentage of low-income families: 11.3%, followed by Brampton, at 9.9%, and Caledon at 3.8%. Table 6.3 shows that Peel has a higher incidence of home ownership than Ontario and Canada. Of the three municipalities in Peel, Caledon reported the highest rate of home ownership in 2001 (89.9%), followed by Brampton with 77% and Mississauga with 71.8%.

The socio-economic indicators reflect the clear picture of socio-economic status of Peel Region. The results from the socio-economic status indicators reveal that Peel has the higher socio-economic status than Ontario and Canada.

6.5.1.2 Health Status

Health is an important aspect of the quality of human life. Mortality and morbidity are major dimensions of health status. Table 6.4 shows the major indicators of health

Table 6.3 Socio-economic indicators: Canada, Ontario, Peel and Peel Municipalities, 2001

Geographical area	Less than grade 9 (%)	Bachelor's degree + (%)	Labour force participation rate (%)	Unemployment rate (%)	Average family income (Can. \$)	Incidence of low income families (%)	Owned dwellings (%)
Canada	10.5	16.9	66.4	7.4	66,160.00	16.2	65.8
Ontario	8.7	19.2	67.3	6.1	73,849.00	14.4	67.8
Peel	7.6	20.7	73.5	5.1	79,324.00	11.6	74.4
<i>City of Mississauga</i>	7.4	24.1	72.6	5.3	80,381.00	12.7	71.8
<i>City of Brampton</i>	8.3	14.7	74.8	5.1	74,263.00	10.8	77.0
<i>Town of Caledon</i>	5.7	17.3	76.9	3.3	98,325.00	4.6	89.9

Table 6.4 Selected health indicators: Peel and Ontario, 1999–2000

Health indicators	Year	Peel	Ontario
Infant mortality rate (Rate per 1,000 live births)	2000	5.0	5.5
Life expectancy at birth – males (years)	2000	78.9 years	76.9 years
Life expectancy at birth – females (years)	2000	83.3 years	82.0 years
Singleton*low birth weight rate (Rate per 100 live births)	2001	4.9	4.3
Suicide rate (Rate per 100,000)	1999	3.69	3.57
Causes of Hospitalization – Top 3 for Men			
Ischemic heart disease (Rate per 100,000)	2000	8.3	9.2
Injury and poisoning (Rate per 100,000)	2000	7.3	8.1
All other heart/circulatory diseases (Rate per 100,000)	2000	4.7	6.0
Causes of Hospitalization – Top 3 for Women			
Labour, delivery, and associated problems (Rate per 100,000)	2000	24.4	17
Complications of pregnancy (Rate per 100,000)	2000	5.0	4.8
Injury and poisoning (Rate per 100,000)	2000	4.3	6.0

NOTES: *A singleton is a baby that is not a twin or multiple births.

status in Peel and the Province of Ontario. It can be seen that women have a longer life expectancy than men. Peel has the higher life expectancy at birth than Ontario as a whole. Hospitalization records are the most comprehensive and accessible source of information on morbidity. In 2000, the most common cause of hospitalization for women was labour, delivery, and associated problems (24.4 per 100,000) and for men was Ischemic heart disease (8.3 per 100,000). Hospitalization statistics are calculated on the basis of admission/separation forms supplied by short-term hospitals. Separation may be due to death, return to domicile or transfer to another facility. Hospitalization statistics make it possible to identify priority health problems. Peel has the higher rate of low birth weight babies and suicide rate than Ontario as a whole.

6.5.1.3 Environmental Status

Between 1990 and 2000, air quality in the Region was considered to be “very good” or “good” about 95% of the time. According to the Ontario Drinking-Water Quality Standards Regulation, tests are performed on thousands of water samples collected throughout the year, all of which proves the Region of Peel municipal water is of excellent quality (Source: Regional of Peel, 2005a).

6.5.1.4 Cultural Diversity in Peel

Table 6.5 shows the indicators of cultural diversity in Peel, Ontario and Canada. In 2001, 43.1% of Peel’s total population was comprised of immigrants, a figure considerably higher than the respective Ontario figure of 26.8%, and the Canadian figure of 18.4%. Of the three municipalities in Peel, Mississauga has the highest proportion of immigrants: 46.8%, followed by Brampton with 39.9%, and Caledon with 19.6%.

Table 6.5 Cultural diversity indicators: Canada, Ontario, Peel and Peel Municipalities, 2001

Geographical area	Immigrant population (%)	Visible minority population (%)	Persons speaking non-official language (%)	Religion reported (%)
Canada	18.4	13.4	17.6	83.8
Ontario	26.8	19.1	23.7	84.0
Peel	43.1	38.5	37.5	88.4
<i>City of Mississauga</i>	46.8	40.3	41.8	88.2
<i>City of Brampton</i>	39.9	40.2	32.2	89.1
<i>Town of Caledon</i>	19.6	5.0	18.1	85.1

Peel has 38.5% of its population reporting themselves as visible minorities, compared to 19.1% in Ontario and 13.4% in Canada. Mississauga and Brampton have almost equal proportions of visible minorities (40.3 and 40.2% respectively). Caledon is almost racially homogenous compared to the very racially diverse Mississauga and Brampton.

In 2001, 37.5% of the Peel population reported speaking a non-official language as their mother tongue. By comparison, 23.7% of Ontario's population reported speaking a mother tongue other than English or French (based on single responses). A large majority, 88% of Peel's (non-institutionalized) population claimed religious affiliation. Based on the cultural diversity indicators, it can be seen that Peel is more racially diverse than Ontario and Canada.

6.5.1.5 Relationship Between Quality of Life Indicators and Cultural Diversity Indicators

Figures 6.4 and 6.5 show the quality of life indicators by population groups. The unemployment rate and the number of families of low income are the key indicators of quality of life. The number of families of low income measures the population considered as poor. Along with education and occupation, income is one of the variables often used as a socioeconomic indicator in studies analyzing the links between social condition and quality of life. In 2000, the incidence of low income of recent immigrants in Peel was more than the overall incidence of low income [31.7 versus 11.6%]. In 2000, the unemployment rate of recent immigrants (12%) was more than twice that of the overall unemployment rate (5%). In 2000, recent Immigrants had the highest unemployment rate at 12%, followed by visible minorities (7%), aboriginals (6%), and francophones (4%).

It seems that the quality of life is better in Peel, as compared to that in Ontario and Canada as a whole. The Region of Peel is undergoing a real-world social experiment. Seeing the results from Figs. (6.4 and 6.5), we can assume that there is a strong relationship between the quality of life indicators and cultural diversity indicators. Refinement in our analysis could be done in the next section. For instance, it may be good to look at the quality of life in Peel at the micro (neighborhood) level and see whether the relationship between the quality of life and cultural diversity observed at the regional level is observable at the neighborhood level.

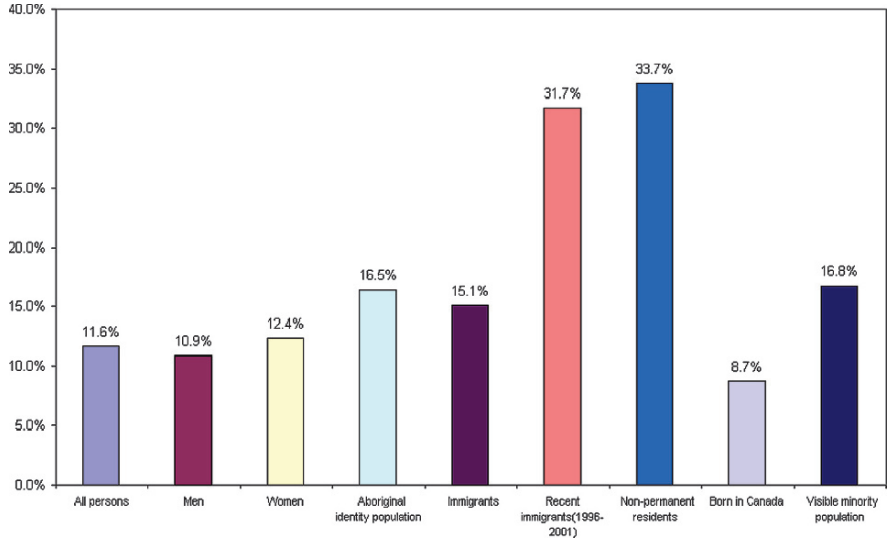


Fig. 6.4 Incidence of low income (%) by population groups: Peel, 2000

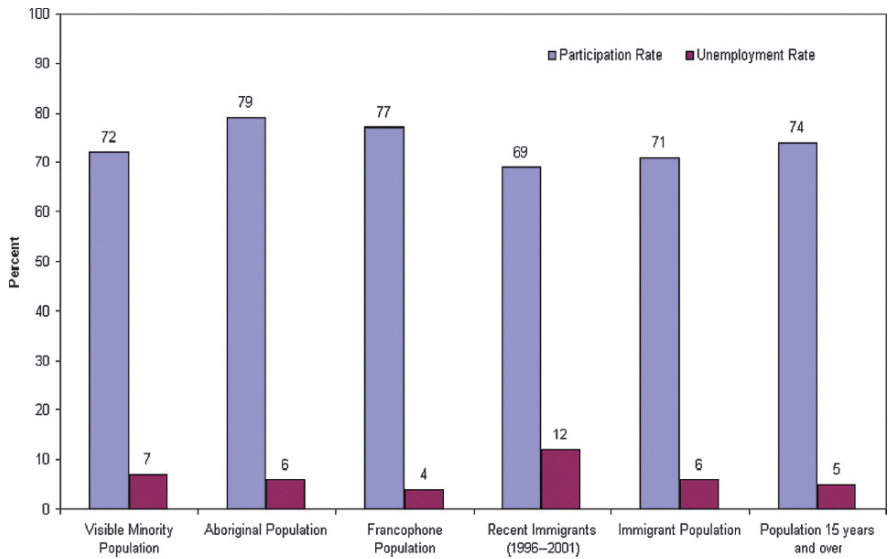


Fig. 6.5 Labour force participation rates (%) and unemployment rates (%) by population groups: Peel, 2001

6.5.2 Micro (Neighborhood) Level Analysis [By Using Taxonomic Method]

It was found that an indicator-by-indicator quality of life comparison would be very cumbersome to perform. So another attempt has been made to provide a combined level of quality of life measure with the help of the taxonomic method. This method would provide the estimates of socio-economic status for 15 major neighborhoods of Peel. Because of the lack of reliable data, we restrict our analysis to the early 2001. To examine the socio-economic status and the level of cultural diversity, the taxonomic method was separately run for Peel. In the present section the level of socio-economic status will be studied on the basis of the seven indicators: (1) Less than Grade 9 (%), 2001; (2) Bachelor's Degree + (%), 2001; (3) Labor Force Participation Rate Aged 15+, 2001; (4) Unemployment Rate (%), 2001; (5) Average Family Income (\$), 2000; (6) Incidence of Low Income Families (%), 2000; and (7) Owned Dwellings (%), 2001.

Out of seven indicators, three indicators (1, 4 & 6) are assumed to be negative or deterrent for socio-economic status and four indicators (2, 3, 5 & 7) are assumed to be positive or promoters for socio-economic status. The primary reason for not selecting some other indicators was that data was not readily available. A secondary reason for not selecting other indicators is that some indicators were not considered relevant for the study.

6.5.2.1 Socio-Economic Status by Peel Neighborhoods

Wide variations in the socio-economic status indicators can be observed in Peel (Table 6.6). At the neighborhood level, Malton has the highest proportion of people with less than a grade 9 education (15.7%) followed by Central Brampton with 9.7% and Gore with 9.4%. The neighborhoods with the lowest percentage of people with a grade 9 education are Caledon (Urban) with only 2.5%, Meadowvale, 3.4%, and Clarkson/Lorne Park, 4.0%. It can be seen that Streetsville has the highest proportion of university graduates within its population (30.2%) followed closely by Creditview with 29.1%, and Clarkson/Lorne Park with 26.4%. Malton has the lowest proportion of university graduates within its population (12.1%) followed by Central Brampton with 13.6%, and Central Brampton with 15.3%.

At the neighborhood level, the highest unemployment rate was in Malton (6.5%), while the lowest was in Caledon (Urban) (1.3%). The neighborhoods with the three lowest labor force participation rates are: Malton: 69.3%; Cooksville/Dixie: 69.4%, and Port Credit/Lakeview: 70.1%. The neighborhoods with the three highest average family incomes were: Clarkson/Lorne Park with \$117,550, Caledon (Urban) with \$ 97,871, and Streetsville with \$94,792. The neighborhoods with the three lowest average family incomes were: Malton, \$50,700; Cooksville/Dixie, \$69,267, and Hurontario, \$72,453. The neighborhoods with the three highest percentages of families living on low incomes were: Malton (20.1%), Cooksville/Dixie (14.5%) and Creditview (11.8%). Gore reported the highest rate of home ownership

Table 6.6 Socio-economic indicators: Peel Neighborhoods, 2001

Neighborhood	Less than grade 9 (%)	Bachelor's degree + (%)	Labour force		Unemployment rate (%)	Average family income (Can. \$)	Incidence of low income families (%)		Owned dwellings(%)
			participation rate aged 15+ (%)	aged 15+ (%)			low income families (%)	Owned dwellings(%)	
Clarkson/Lorne Park	4.0	26.4	71.5	5.1	117,550.00	6.9	76.7		
Cooksville/Dixie	9.3	22.3	69.4	5.8	69,267.00	14.5	57.7		
Creditview	7.6	29.1	74.2	4.7	76,668.00	11.8	85.2		
Erin Mills/Erindale	5.3	26.0	73.3	5.4	90,017.00	10.1	75.3		
Hurontario	8.8	25.3	74.4	5.6	72,453.00	11.6	77.3		
Malton	15.7	12.1	69.3	6.5	50,700.00	20.1	65.5		
Meadowvale	3.4	24.8	79.0	4.4	88,842.00	7.0	83.0		
Port Credit/Lakeview	8.3	19.6	70.1	4.5	83,527.00	10.4	63.5		
Streetsville	5.7	30.2	73.2	5.0	94,792.00	8.5	86.3		
Bramalea	7.7	15.3	75.2	5.0	74,511.00	9.5	79.5		
Central Brampton	9.7	13.6	73.2	5.3	69,581.00	11.4	71.1		
Gore	9.4	22.2	75.3	2.1	91,406.00	4.5	98.3		
Heartlake	5.0	16.5	80.1	4.7	86,942.00	5.8	93.6		
Bolton	6.7	16.6	78.4	3.1	93,419.00	4.2	91.2		
Caledon (Urban)	2.5	18.2	76.9	1.3	97,871.00	5.9	98.1		

(98.3%) followed closely by Caledon (Urban), Heartlake and Bolton. The neighborhoods with the highest rates of rental housing are: Cooksville/Dixie (42.3%), Port Credit/Lakeview (36.5%) and Malton (34.5%).

Since the taxonomic method, like many others, aims at constructing a unitary index of development, it is necessary to add up, at an appropriate stage, the value of all selected indicators. But since the original values of the different indicators are likely to be in different units, they cannot be pooled directly. It is therefore necessary to convert the original values of the indicators into some standardized values.

The pattern of development is simply the composite distance from the ideal neighborhood. Table 6.7 shows the patterns and measures of socio-economic status for 15 major neighborhoods in Peel. The “measure (SEI)” of development is a function of the “pattern” and “critical distance” from the ideal neighborhood. It is non-negative and lies between 0 and 1 (in the majority cases). It may exceed 1 (some cases) but always non-negative. The closer the “measure” to “0”, the more developed is the neighborhood, and the closer to “1”, the less developed is the neighborhood. It can be seen that Caledon (urban) has the highest socio-economic status, followed by Meadowvale, Gore, Bolton and Heartlake, respectively. Malton has the least developed socio-economic status. Figure 6.6 shows the map of socio-economic index by Peel neighborhoods. The higher the value of socio-economic index (SEI), lower is the level of socio-economic status. It is found that Caledon (urban), Meadowvale, Gore, and Bolton have the highest levels of socio-economic status and Malton has the least level of socio-economic status.

By using the mapping technique, we can classify the neighborhoods of Peel as follows:

Table 6.7 Socio-economic index (SEI): Peel Neighborhoods, 2001

Neighborhood	Pattern (cio)	Socio-economic index (SEI)	Rank
Clarkson/Lorne Park	4.24953	0.49519	7
Cooksville/Dixie	7.27919	0.84824	14
Creditview	4.76112	0.55481	8
Erin Mills/Erindale	4.74391	0.55280	9
Hurontario	5.57362	0.64949	11
Malton	9.49156	1.10604	15
Meadowvale	3.36691	0.39234	2
Port Credit/Lakeview	5.95419	0.69384	12
Streetsville	4.03601	0.47031	6
Bramalea	5.47002	0.63742	10
Central Brampton	6.54560	0.76275	13
Gore	3.39917	0.39610	3
Heartlake	4.04808	0.47172	5
Bolton	3.45590	0.40271	4
Caledon (Urban)	2.65696	0.30961	1

Notes: The closer the “measure” to “0”, the more developed is the neighborhood, and the closer to “1”, the less developed is the neighborhood (SEI=cio/co).

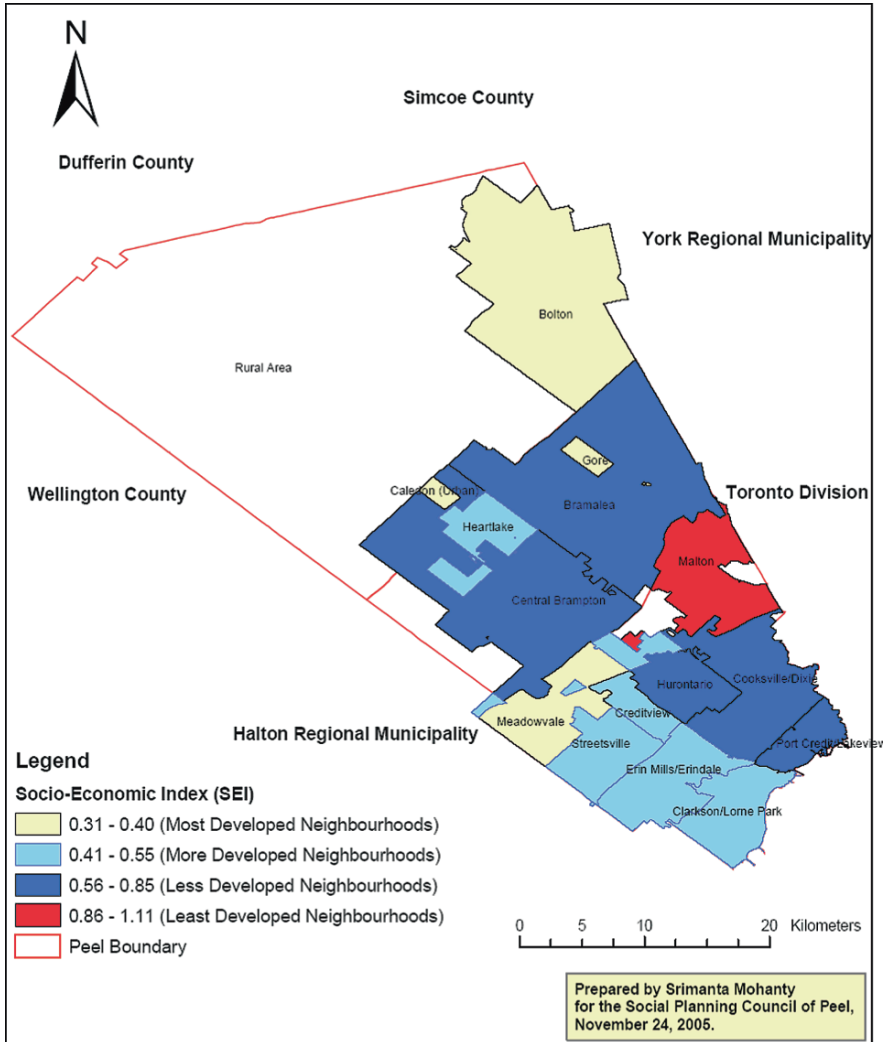


Fig. 6.6 Socio-economic index (SEI) by Peel neighbourhoods, 2001.

Note: The closer the ‘SEI’ is to “0”, the more developed is the neighbourhood, and the closer to “1”, the less developed is the neighbourhood

Source: Statistics Canada, Census of Canada, 2001.

- Most Developed Neighborhoods (Highest Socio-Economic Status): Caledon (Urban), Meadowvale, Gore and Bolton.
- More Developed Neighborhoods (High Socio-Economic Status): Heartlake, Streetsville, Clarkson/Lorne Park, Creditview, and Erin Mills/Erindale.
- Less Developed Neighborhoods (Low Socio-Economic Status): Bramalea, Hurontario, Port Credit/Lakeview, Central Brampton and Cooksville/Dixie.
- Least Developed Neighborhoods (Lowest Socio-Economic Status): Malton.

Table 6.8 Cultural diversity indicators: Peel Neighbourhoods, 2001

Neighborhood	Immigrant population (%)	Visible minority population (%)	Persons speaking non-official language (%)	Religion reported (%)
Clarkson/Lorne Park	32.6	18.7	24.5	84.3
Cooksville/Dixie	53.6	40.1	51.4	89.0
Creditview	56.8	60.8	53.3	87.2
Erin Mills/Erindale	42.4	36.5	36.1	87.4
Hurontario	56.3	54.9	52.4	89.8
Malton	58.9	69.0	51.2	94.7
Meadowvale	36.0	31.6	28.0	88.0
Port Credit/Lakeview	31.8	12.3	29.2	85.5
Streetsville	45.4	44.2	41.0	86.6
Bramalea	41.3	42.8	32.6	89.2
Central Brampton	40.5	40.4	33.7	89.2
Gore	44.3	60.4	49.3	94.2
Heartlake	32.5	29.4	23.9	87.9
Bolton	20.5	5.1	21.6	87.0
Caledon (Urban)	26.1	16.8	17.4	89.5

6.5.2.2 Cultural Diversity by Peel Neighborhoods

Wide variations in the cultural diversity indicators can be observed in Peel (Table 6.8). At the neighborhood level, the three largest proportions of immigrants are in Malton 58.9%; Hurontario, 56.3%; and Cooksville/Dixie, 53.6%.

The neighborhoods with the lowest proportions of immigrants are Bolton (20.5%); Caledon (Urban) with 26.1%, and Port Credit/Lakeview with 31.8%. Outside of Caledon, the neighborhoods with the lowest proportion of immigrants are Port Credit/Lakeview with 31.8%, Heartlake with 32.5% and Clarkson/Lorne Park with 32.6%.

At the neighborhood level, Malton, Creditview, and Gore have the highest proportions of visible minorities. Beyond Caledon, the neighborhoods with the lowest proportions of visible minorities are Port Credit/Lakeview, Clarkson/Lorne Park, and Heartlake.

The pattern of cultural diversity is simply the composite distance from the ideal neighborhood. Table 6.9 shows the patterns and measures of cultural diversity for 15 major neighborhoods in Peel. The “measure (CDI)” of cultural diversity is a function of the “pattern” and “critical distance” from the ideal neighborhood. It is non-negative and lies between 0 and 1 (in the majority cases). It may exceed 1 (some cases) but always non-negative. The closer the “CDI” is to “0”, the greater the cultural diversity in the neighborhood, and the closer to “1”, the lower the cultural diversity in the neighborhood. It can be seen that Malton has the greatest level of cultural diversity and Bolton has the lowest level of cultural diversity (Fig. 6.7). By using the mapping technique, we can classify the neighborhoods of Peel as follows:

Table 6.9 Cultural diversity index (CDI): Peel Neighborhoods, 2001

Neighborhood	Pattern	Cultural diversity index (CDI)	Rank
Clarkson/Lorne Park	5.58261	0.81161	14
Cooksville/Dixie	2.58341	0.37558	4
Creditview	2.70942	0.39390	5
Erin Mills/Erindale	3.68738	0.53608	9
Hurontario	1.91031	0.27773	3
Malton	0.16770	0.02438	1
Meadowvale	4.18963	0.60910	10
Port Credit/Lakeview	5.36931	0.78060	13
Streetsville	3.51237	0.51064	8
Bramalea	3.28214	0.47716	6
Central Brampton	3.32717	0.48371	7
Gore	1.38554	0.20143	2
Heartlake	4.57224	0.66472	11
Bolton	6.01934	0.87510	15
Caledon (Urban)	5.21692	0.75845	12

- Greatest Diversity: Malton, Gore and Hurontario.
- Greater Diversity: Cooksville/Dixie, Creditview, Bramalea, Central Brampton, Streetsville and Erin Mills/Erindale.
- Lower Diversity: Meadowvale and Heartlake.
- Lowest Diversity: Caledon (Urban), Port Credit/Lakeview, Clarkson/ Lorne Park and Bolton.

6.5.2.3 Relationship Between Socio-Economic Indices and Cultural Diversity Indices

Table 6.10 shows the classification of Peel neighborhoods according to the socio-economic status and cultural diversity. Bolton has the highest level of socio-economic status and the lowest level of diversity. Malton has the lowest level of socio-economic status and the greatest level of diversity. At the neighborhood level, there appears to be an inverse relationship between socio-economic status and cultural diversity of the residents (correlation coefficient = $[(-0.585)$; significant at 0.05 level]). Figure 6.8 displays the combination of both socio-economic and diversity elements. Gore is different from the others. It is a new neighborhood with almost 2,250 people. Gore has the highest level of socio-economic status and the greatest level of diversity. It can be seen that Gore and Malton have the highest levels of cultural diversity. In 2001, the largest group of visible minorities in Gore and Malton was South Asians. The average family income in Gore was Can \$91,406 in 2000. But the average family income in Malton was Can \$50,700 in 2000.

6.5.2.4 Potential Targets and Goals for Socio-Economic Indicators

In this section, we wish to identify “ideal/model” neighborhoods and set potential targets for the socio-economic indicators for Cooksville/Dixie by using the

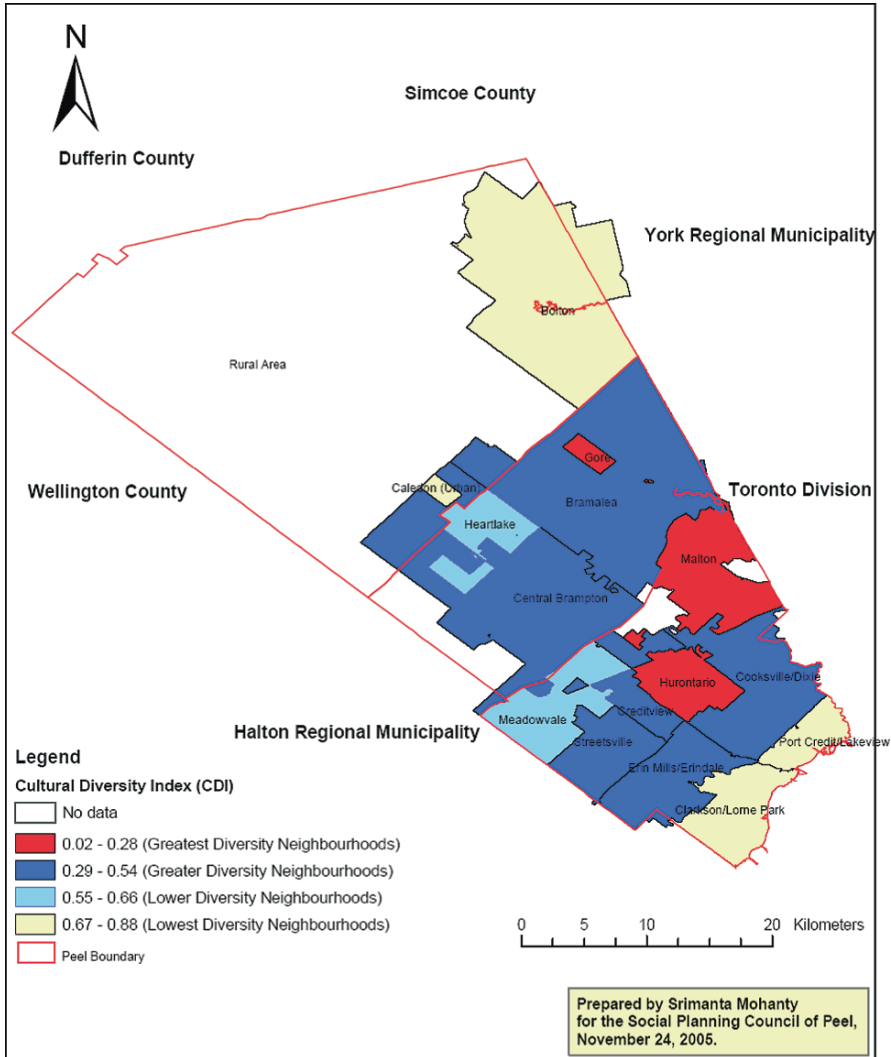


Fig. 6.7 Cultural diversity index (CDI) by Peel neighbourhoods, 2001.
 Notes: The closer the ‘CDI’ is to ‘0’, the greater the cultural diversity in the neighbourhood, and the closer to ‘1’, the lower the cultural diversity in the neighbourhood.
 Source: Statistics Canada, Census of Canada, 2001

taxonomic method. The “model” neighborhoods for Cooksville/Dixie should meet two conditions: (i) the measures of development (SEI) should be higher than Cooksville/Dixie; and (ii) the distances of each of their respective model neighborhoods should not be more than the Critical Minimum Distance (C.M.D.). If the distance between any neighborhood and every other neighborhood is longer than critical minimum distance (C.M.D.) or shorter than critical value (C.V.) that

Table 6.10 Classification of Peel neighborhoods according to the socio-economic status and cultural diversity

CDI\SEI	Most developed neighborhoods	More developed neighborhoods	Less developed neighborhoods	Least developed neighborhoods
Greatest Diversity	Gore		Hurontario	Malton
Greater Diversity		Streetsville, Creditview, and Erin Mills/Erindale	Bramalea, Central Brampton and Cooksville/Dixie	
Lower Diversity	Medowvale	Heartlake		
Lowest Diversity	Caledon (Urban) and Bolton	Clarkson/Lorne Park	Port Credit/Lakeview	

neighborhood would not join any sub-group and is called atypical neighborhood (The computations of C.M.D and C.V. are explained in the methodology). The critical minimum distance value is 2.74.

It is found that three neighborhoods meet the first and second criteria to be the models for Cooksvilles/Dixie. The neighborhoods that meet the first criterion to be the models for Cooksvilles/Dixie, their measures of socio-economic status, and their distances from Cooksvilles/Dixie are shown in Table 6.11. Of the 13 neighborhoods that meet the first criterion to be the models for Cooksvilles/Dixie do not meet the second criterion because their distances from Cooksvilles/Dixie are exceed the C.M.D (2.74). Thus three neighborhoods such as Hurontario, Port Credit/Lakeview and Central Brampton serve as models for Cooksvilles/Dixie.

The potential targets for the socio-economic indicators for Cooksvilles/Dixie are the arithmetic means of the values of the particular indicators for their respective model neighborhoods (Table 6.12). The arithmetic means of the values of indicators for the model should serve as potential targets. A given point (value of indicator) does not necessarily mean that the arithmetic means of the values of all the indicators for the model points is always higher than the values of all the indicators for a given point. Sometimes it happens that the value of a particular indicator of a given point will be equal or even higher than, the arithmetic mean of the values of the indicators for the model points. This is not the weakness of the taxonomic method, but rather its strength. The method only shows that the particular indicator is relatively well developed and not much attention is necessary in the immediate future to improve it further. With such knowledge, a planner can trade off the scarce resources to improve other indicators in the group. The point may be illustrated with an example. Suppose we wish to fix potential target for persons with Bachelor's degree and over (%) for Cooksvilles/Dixie. The model neighborhoods of Cooksvilles/Dixie are Hurontario, Port Credit/Lakeview and Central Brampton, and the arithmetic mean of persons with Bachelor's degree and over (%) is 19.5% that is less than Cooksvilles/Dixie's current Bachelor's degree and over of 22.3%. From this result, it is assumed that the persons with Bachelor's degree and over (%) for Cooksvilles/Dixie is better developed than other socio-economic indicators.

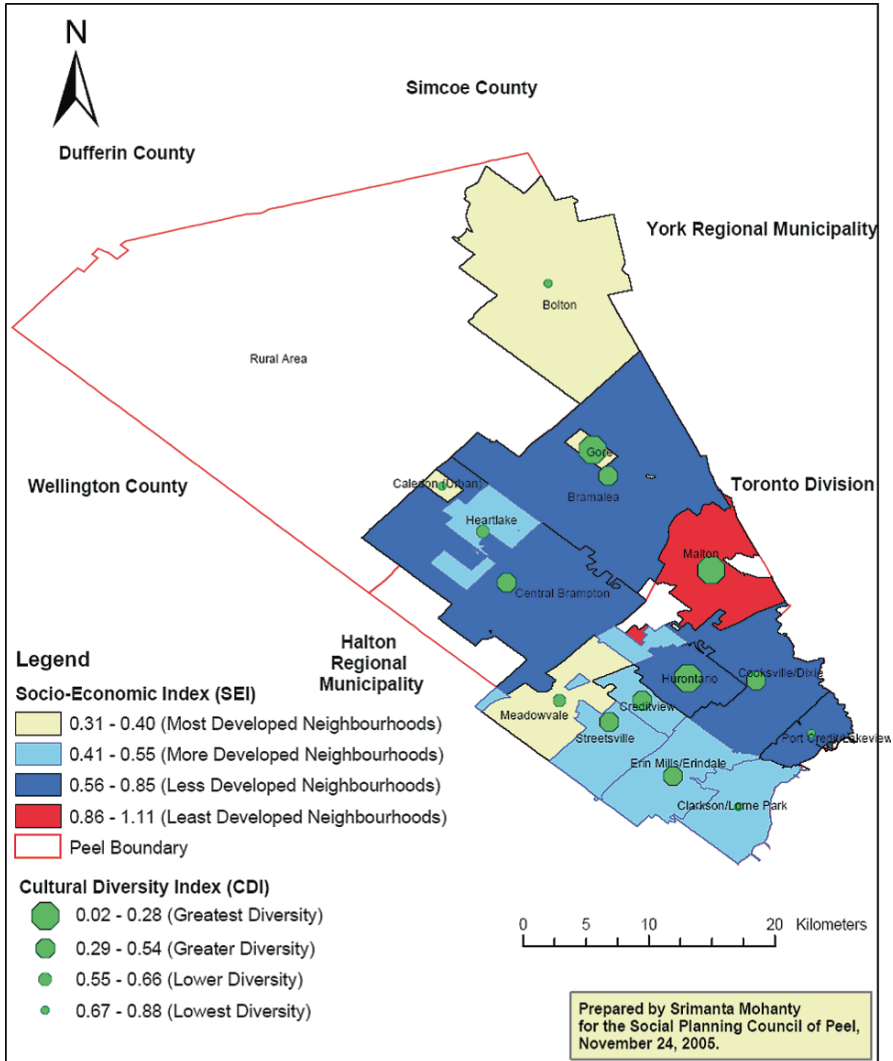


Fig. 6.8 Socio-Economic Status & Cultural Diversity by Peel Neighbourhoods, 2001
 Note: There appears to be an inverse relationship between cultural diversity and socio-economic status of the Peel residents.
 Source: Statistics Canada, Census of Canada, 2001

6.6 Summary and Conclusion

We have seen that “quality of life” cannot be easily defined and measured. The objectives of this study have been well served. We have provided empirical support for both the micro level and macro level perspectives on quality of life and cultural diversity. Quality of life is best modeled by taking into consideration socio-

Table 6.11 Neighborhoods meeting the two conditions to be models for Cooksville/Dixie [Critical Minimum Distance (C.M.D) =2.74]

Neighborhood	Socio-economic index (SEI)	Distance from Cooksville/Dixie
Caledon (Urban)	0.30961	6.196
Meadowvale	0.39234	3.296
Gore	0.39610	5.343
Bolton	0.40271	5.314
Streetsville	0.47031	3.841
Heartlake	0.47172	5.239
Clarkson/Lorne Park	0.49519	4.344
Erin Mills/Erindale	0.55280	2.865
Creditview	0.55481	3.148
Bramalea	0.63742	3.110
Hurontario	0.64949	2.355
Port Credit/Lakeview	0.69384	1.796
Central Brampton	0.76275	2.337
Cooksville/Dixie	0.84824	0.000

economic, health, environment and cultural factors. We found that Peel has a very high level of ethnic diversity in its population and the quality of life in Peel is better than Ontario and Canada as a whole. At the neighborhood level, Bolton has the highest level of socio-economic status and the lowest level of cultural diversity. Malton has the lowest level of socio-economic status and greatest level of cultural diversity. An interesting though not surprising result that emerges from analysis presented here is that the cultural diversity has an impact on quality of life of residents in Peel. The analysis has suggested that cultural factors may contribute more to explaining quality of life across neighborhoods in Peel.

The findings point out that there is a negative relationship between socio-economic status and cultural diversity at the neighborhood level. Many of neighborhoods in Peel need special attention in order to raise them up to the level of other neighborhoods in terms of socio-economic status. This analysis of the socio-economic status of different neighborhoods in Peel provides policymakers and community service workers with a picture of the strengths and challenges that characterize those neighborhoods. The main value of this analysis is that it can be used to inform decision-making about priorities for social services and community development in Peel Region.

The method has proved to be useful in ranking, classifying and comparing the neighborhoods on various quality of life (QOL) dimensions. The method only shows that the particular indicator is relatively well developed and not much attention is necessary in the immediate future to improve it further. With such knowledge, a planner can trade off the scarce resources to improve other indicators in the group. The research methodology involves a novel statistical application. This study is useful in identifying indicators of spatial imbalances in socio-economic status with a view to setting up targets in allocating scarce resources.

Table 6.12 Potential targets for the socio-economic status indicators for Cooksville/Dixie

Model neighborhoods for Cooksville/Dixie	Less than grade 9 (%)	Bachelor's degree + (%)	Labour force participation rate (%)	Unemployment rate (%)	Average income (Can. \$)	Incidence of low income families (%)	Owned dwellings (%)
Hurontario	8.8	25.3	74.4	5.6	72,453.00	11.6	77.3
Port Credit/Lakeview	8.3	19.6	70.1	4.5	83,527.00	10.4	63.5
Central Brampton	9.7	13.6	73.2	5.3	69,581.00	11.4	71.1
Mean Target	8.9	19.5	72.6	5.1	75,187.00	11.1	70.6
Cooksville/Dixie (Current level)	9.3	22.3 (Well developed indicator)	69.4	5.8	69,267.00	14.5	57.7

Data for health and environment by Peel neighborhoods were not available. So the study presents only the quantitative analysis of socio-economic dimension of QOL in Peel neighborhoods. The number of indicators selected for the quantitative analysis of socio-economic status and cultural diversity may be inadequate. Although this provides a limited picture, the study does address important QOL issues. It is doubtful whether the picture of socio-economic status in different neighborhoods would alter significantly if more indicators were added. The taxonomic method does not place any limit on the number of indicators to be selected and used.

Thus from the above discussion, it is hoped that this will initiate a healthy debate on the question of quality of life and cultural diversity in Peel, and will provide a new direction for moving towards “neighborhood level development”. This study has provided a good look at how a community can be aided in better managing the rapidly changing face of their community in an effort to maintain or enhance the quality of life for the community. Furthermore, the knowledge, skills and values gained from this study can be shared with the rest of the world.

Coordination and cooperation of government and non-government organizations (NGOs) are necessary to improve the quality of life and reducing the regional imbalances at the local level. Peel’s well educated, culturally diverse, high earning population should be encouraged to improve the quality of life in Peel.

6.7 Technical Notes (Definitions)

Cultural Diversity Indicators

- Mother tongue refers to the first language learned at home in childhood and still understood by the individual at the time of the Census.
- Immigrant Population: People who are or who have ever been landed immigrants. Landed immigrants are people born outside of Canada who have been permitted by immigration authorities to live in Canada permanently; some will have lived in Canada for a number of years, while others have arrived recently.
- Visible Minorities: Under the Employment Equity Act of Canada, members of visible minorities are persons, other than Aboriginal persons, who are not white in race or colour.
- Religion: Refers to specific religious denominations, groups or bodies, as well as to sects, cults, or other religiously defined communities or systems of belief.

Quality of Life Indicators

- Labour force participation rate refers to the total labour force, expressed as a percentage of the population 15 years of age and over.
- Unemployment rate refers to the unemployed labour force expressed as a percentage of the total labour force.

- Low Income Cut-offs (LICO): Income levels at which families or unattached individuals spend 20% more than average on food, shelter and clothing. The following is Statistics Canada's 2000 matrix of low income cut-offs:

Size of population in area of residence					
Family size	500,000 or more	100,000–499,999	30,000–99,999	Small urban regions	Rural (farm and non-farm)
1	\$18,371	\$15,757	\$15,648	\$14,561	\$12,696
2	22,964	19,697	19,561	18,201	15,870
3	28,560	24,497	24,326	22,635	19,738
4	34,572	29,653	29,448	27,404	23,892
5	38,646	33,148	32,917	30,629	26,708
6	42,719	36,642	36,387	33,857	29,524
7+	46,793	40,137	39,857	37,085	32,340

- Incidence of low income is the proportion or percentage of economic families or unattached individuals in a given classification below the low income cut-off.
- Low birth weight rate indicates the number of live births less than 2,500 grams relative to all live births (usually expressed as a percent).

For more detailed definitions, please visit the 2001 Census Dictionary (Statistics Canada): <http://www12.statcan.ca/english/census01/Products/Reference/dict/index.htm>

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Chapter 7

Measuring Quality of Life in Canadian Municipalities

John Burrett

Abstract Municipalities have a growing role in sustainable development and providing for quality of life, as their responsibilities increase in number and complexity. City hall now needs improved means to plan and manage, involving the community, and to demonstrate transparency and accountability to citizens and the other orders of government. This article is intended to give the reader a brief overview of the Federation of Canadian Municipalities' Quality of Life Reporting System. This will include a discussion of the history of the system, its various uses, structure of indicators and issue-areas, or "domains", key findings of the most recent series of reports, and plans for future expansion of scope and content.

7.1 Introduction

Canada's municipalities now operate on a world stage. Our big cities and metropolitan regions already primarily compete with the other great urban centers of the world for investment, skills and trade. Smaller centers increasingly enter this world as well, and in particular need to be attractive to people and business in order to maintain their prosperity.

Quality of life is of course a primary goal in itself for any municipal government. But the nature of the community, its assets and liabilities in terms of quality of environment, economic opportunity, social cohesion and inclusiveness and richness of culture, is increasingly a key to a future of prosperity rather than decline.

Recent years have seen the growing importance of managing to achieve sustainable communities. The Government of Canada has recently centered much of its approach to urban issues on motivating more environmentally sustainable investments, planning and practices by municipal governments. While sustainability is

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generally understood to concern conservation of the environment, considerations of economic and social development and of the cultural fabric also apply.

Municipalities have a growing role in sustainable development and providing for quality of life, as their responsibilities increase in number and complexity. City hall now needs improved means to plan and manage, involving the community, and to demonstrate transparency and accountability to citizens and the other orders of government.

This article is intended to give the reader a brief overview of the Federation of Canadian Municipalities' Quality of Life Reporting System FCM has been the national voice of municipal governments since 1901. The organization is dedicated to improving the quality of life in all communities by promoting strong, effective and accountable municipal government. FCM membership includes Canada's largest cities, small towns, rural municipalities, and the 19 major provincial and territorial municipal associations. This will include a discussion of the history of the system, its various uses, structure of indicators and issue-areas, or "domains", key findings of the most recent series of reports, and plans for future expansion of scope and content.

7.2 Federation of Canadian Municipalities' Quality of Life Reporting System

The Federation of Canadian Municipalities' (FCM) Quality of Life Reporting System (QOLRS) has been in operation since 1996. Conceived by a group of large municipal governments, the system was to track changes, primarily in social conditions, following changes in the system of federal/provincial/territorial social support funding in the middle of that decade. The system's scope has now grown to cover the local economy and environmental conditions.

Currently 22 Canadian cities and regional municipal governments participate:

Cities:

- City of Vancouver
- City of Calgary
- City of Edmonton
- City of Regina
- City of Saskatoon
- City of Winnipeg
- City of Greater Sudbury
- City of London
- City of Toronto
- City of Hamilton
- City of Ottawa
- Ville de Gatineau
- Ville de Laval

Regional Municipalities:

- Regional Municipality of Waterloo
- Regional Municipality of Niagara
- Regional Municipality of Halton
- Regional Municipality of Peel
- Regional Municipality of York
- Regional Municipality of Durham
- Communauté métropolitaine de Québec
- Communauté métropolitain de Montreal
- Halifax Regional Municipality

Other major cities and regional municipalities in Canada are currently considering membership, and work is underway to develop the capability of serving smaller centers.

Three rounds of reports have now been released, in 1991, 1996 and 2004–2005. The reports have relied on Census of Canada data for approximately half of the indicators, along with data from other government departments and various non-profit and commercial sources. A significant portion of the data used came from surveys of the participating municipalities. The system produced 72 indicators of local conditions and municipal activities for the latest round of reports. All reports of the QOLRS, as well as all current indicators and the underlying data and metadata are available free of charge on the FCM website: www.fcm.ca/quality_of_life.

7.3 Multiple Uses of the QOLRS

FCM itself primarily uses the national reports and data to strengthen its advocacy initiatives in support of the municipal sector, targeted to the Government of Canada. The system covers primarily issues of social and economic conditions and has therefore thus far been most useful in promoting those issues. As the system evolves, it is expected to expand to cover more environmental issues and address the infrastructure and service provision capabilities of municipalities, relative to their growing responsibilities.

The system has produced a large database, disaggregated at the level of the municipal government, which is used extensively by its members. Disaggregation using municipal boundaries is one of the unique features of the QOLRS. Most analyses of “local” issues outside the QOLRS system are done at the level of Census Subdivisions and Census Metropolitan Areas, and hence do not necessarily reflect the issues that a given municipal government faces. This orientation, of course, reflects the orientation of FCM, as a representative of municipal government.

Even better would be the ability to perform analyses on a wide range of issues at the level of individual neighborhoods. This is a potential area for work involving FCM and Statistics Canada (At time of writing, FCM and Statistics Canada have begun discussions on Statistics Canada’s proposed Community Data Outreach

Strategy, which may yield progress in this regard). An excellent example of a neighborhood-based data system, open to use by all citizens, can be found in the Province of Newfoundland's Community Accounts (www.communityaccounts.ca). The Canadian Council for Social Development is also developing a data system to allow users to "drill down" into neighborhoods to analyse social conditions. To date, this has been an expensive proposition with limited take-up (www.ccsd.ca).

Using the database, QOLRS members produce their own local reports. Local reports perform a number of functions.

Members of the QOLRS use their reports and data, along with the reports prepared by FCM, to inform their municipal councils and help guide discussions on priorities, planning and budgeting, as well as to point out issues to their provincial governments. Outcomes and conditions measures, as found in the FCM system, help to point out areas in which a municipality may have to effect improvements, or can, conversely, confirm that overall targets are being reached.

It is important to recognize that this style of measurement and management feedback is distinct from more formal "performance measurement" systems, which are now in place in a number of municipalities, and are being required of municipalities by several provinces. Mandated performance measurement systems generally concentrate on process and cost efficiency.

That being said, a number of municipalities are now integrating a balance of organizational measures, employee measures, financial health indicators, and community "quality of life" indicators. One of the goals of the FCM team now is to more fully integrate the QOLRS with their own management information and performance reporting systems.

Most QOLRS participants use their local reports as a means to report to their citizens, and many use the reports as the basis for community planning sessions involving citizens at large.

Finally, the system is a network of municipal government officials, both elected and staff, who are engaged in the process of improving their management capabilities to support their communities' quality of life.

7.4 Definition of Quality of Life as Structure for Analysis

In order to guide the project, a definition of quality of life was required. The technical team eventually agreed upon the following definition:

"Quality of life is enhanced and reinforced in municipalities that:

- Develop and maintain a vibrant local economy;
- Protect and enhance the natural and built environment;
- Offer opportunities for the attainment of personal goals, hopes and aspirations;
- Promote a fair and equitable sharing of common resources;
- Enable residents to meet their basic needs; and,
- Support rich social interactions and the inclusion of all residents in community life."

Implicit in this definition is the fact that the quality of life in any given municipality is influenced by interrelated factors such as: affordable, appropriate housing; civic engagement; community and social infrastructure; education; employment; the local economy; the natural environment; personal and community health; personal financial security; and personal safety.

The definition was then used to guide the development of indicators and structure analyses and reports. All indicators were to speak significantly to at least one of its elements, and the series of reports produced linked the analysis directly to the definition.

The development of the definition of quality of life and its use to focus the choice of indicators follows from the recommendations of a 2002 independent evaluation of the system. Nevertheless, it remains the case that the conceptual framework is more a product of the shared expertise of the project technical team and their municipal government colleagues, and less directly a product of theory. [“Quality of Life Reporting System: Final Report” Flett Consulting Group Inc. and Flotenn Consultants, for FCM, unpublished, May 2002. This evaluation, plus a second unpublished study in 2005, evaluated the system’s indicators from the viewpoint of evidence of relevance to FCM and other organizations, reliability of the data, uniqueness (to avoid multiple measures of the same phenomenon, and simplicity). These were not theoretical exercises, however, concentrating on the practical usefulness of the indicators and data.]

There is no consensus in the field on these issues, and the QOLRS team, generally operating on new ground, has developed the existing system based on their knowledge of municipal issues, the measures used by their municipality, their municipalities’ and FCMs measurement needs, availability of data, and theoretical issues. The extent of the underlying body of theory that is more, or sometimes, less, connected to this work is therefore vast, and it would not be possible to summarize here.

An interesting future step for the QOLRS would be to revisit and fully document the theoretical foundations of the definition of “quality of life”, the domains and indicators that have been adopted in the context of a working, “real world” system.

As noted later in this article, the system is undergoing redevelopment to better cover the concept of “sustainability” and to improve measures of municipal infrastructure relevant to the observed outcomes in the community (While still a topic of debate, “sustainability”, in public policy circles, refers to a state whereby current actions do not detract from the future quality of life, along the dimensions of economic performance, social equity and environmental health). Theoretical issues will play a part in this work and it is always preferable to have as rigorous a foundation as possible for all measurements and analyses. Nevertheless, the imperatives of demand for information to guide policy, relevance of the measures to the QOLRS members and issues of the availability and periodicity of data will shape the system. (A current initiative of the World Bank, to develop urban indicators to assist its lending practice in Latin America and the Caribbean, will be helpful in this regard. The Bank is working with several Canadian cities, members of the QOLRS, with FCM and the Government of Canada, to pilot the development of

these indicators. Conclusions of the work will serve to confirm or challenge the suitability of QOLRS indicators, and provide enhanced theoretical and conceptual background to the system’s content).

7.5 Domains and Indicators

The QOLRS currently uses 72 indicators, grouped into a set of “domains”, which are sets of indicators related principally to one aspect of quality of life or description of conditions.

Note that the first domain contains demographic statistics. Demographic information was cross-tabulated by Statistics Canada with key indicators selected by the technical team to permit analyses involving household type, income, immigration background and other key factors in order to understand observed quality of life outcomes in detail. This is particularly important in understanding social policy issues.

Figure 7.1 summarizes the domains and indicators. The domains are indicated on the top row, with the columns containing the indicators. Because the descriptions of

Demographic & Background Information (DBI)	Affordable, Appropriate Housing (AAH)	Civic Engagement (CE)	Community and Social Infrastructure (CSI)	Education (ED)	Employment (EM)	Local Economy (LE)	Natural Environment (NE)	Personal & Community Health (PCH)	Personal Financial Security (PFS)	Personal Safety (PS)
DBI1 Population Growth	AAH1 30%+ Income on Shelter	CE1 Voter Turnout	CSI1 Social Housing Waiting Lists	ED1 Education Levels	EM1 Unemployment Employment Rates	LE1 Business Bankruptcies	NE1 Air Quality	PCH1 Low Birth Weight Babies	PFS1 Community Affordability	PS1 Young Offenders
DBI2 Household & Family Composition	AAH2 50%+ Income on Shelter	CE2 Women in Municipal Government	CSI2 Rent-Geared-to-Income Housing	ED2 Literacy Levels	EM2 Quality of Employment	LE2 Consumer Bankruptcies	NE2 Urban Transportation	PCH2 Teen Births	PFS2 Families Receiving EI Social Assistance	PS2 Violent Crimes
DBI3 Average Income	AAH3 Core Housing Need	CE3 Newspaper Circulation	CSI3 Social Assistance Allowance	ED3 Adult Learning	EM3 Long Term Unemployment	LE3 Hourly Wages	NE3 Population Density	PCH3 Premature Mortality	PFS3 Economic Dependency Ratio	PS3 Property Crimes
DBI4 Renters & Owners	AAH4 Substandard Units	CE4 Volunteering	CSI4 Subsidized Child Care Spaces	ED4 Education Expenditures	EM4 Labour Force Replacement	LE4 Change in Family Income	NE4 Water Contamination	PCH4 Work Hours Lost	PFS4 Lone Parent Families	PS4 Injuries and poisonings
DBI5 Population Mobility	AAH5 Changing Face of Homelessness	CE5 Charitable Donations	CSI5 Public Transit Costs	ED5 Classroom Size		LE5 Building Permits	NE5 Wastewater Treatment	PCH5 Suicides	PFS5 Incidence of Low Income Families	
DBI6 Foreign Born	AAH6 Vacancy Rates		CSI6 Social Service Professionals	ED6 Student / Teacher Ratio			NE6 Solid Waste	PCH6 Infant Mortality	PS6 Children Living in Poverty	
DBI7 New Immigrant Groups	AAH7 Rental Housing Starts		CSI7 Private Health Care Expenditures	ED7 Post-Secondary Tuition			NE7 Ecological Footprint		PFS7 Income Gap	
DBI8 Language Spoken at Home	AAH8 Monthly Rent			ED8 Spending on Private Education			NE8 Recreational Water Quality			
DBI9 Visible Minorities										
DBI10 Aboriginal Population										

Report 1 Income, Shelter & Necessities

Fig. 7.1 FCM AOLRS indicators

many of the indicators, data and data sources are lengthy and sometimes complex, they are not presented here. All indicators are documented and presented on the FCM website.

As discussed in the previous section, the indicators for the 2005–2005 reports were developed by a consensus of the members of the team and informed by input from planning and service delivery staff in the participating municipalities.

Many indicators were held over from the previous reports, to preserve continuity. This is an important consideration in the ongoing refinement of the indicators because maintenance of indicators over time yields time series. In the case of the QOLRS, this now permits a ten-year perspective on how conditions and issues have evolved in the member municipalities.

Maintenance of indicators for continuity, however, has to be balanced with the advantages of replacing or improving existing indicators, and adding new indicators, as the system evolves and more experience is gained, and the need to keep the size of the database manageable.

Behind each indicator, there is at least one data set. Most are populated with data from 1991, 1996 and 2001, corresponding to Census of Canada years (1991 data for all data sets, subject to availability, was purchased in advance of production of the 2004–2005 series of reports, in order to allow for a ten-year perspective). Many indicators are calculated from several sets of data. All data and calculations are documented in data files and “metadata” tables available on the FCM website.

Data were collected from a total of 12 sources, with the majority coming from Statistics Canada, other Government of Canada sources and a survey of the QOLRS municipalities. Data are presented for each of the QOLRS municipalities, plus population-weighted averages over all of the QOLRS municipalities and for the “Rest of Canada”, excluding data for the QOLRS municipalities.

Qualitative and anecdotal data have also been used extensively in FCMs reports to clarify, illustrate and expand on issues raised by quantitative data or to allow commentary where no data set exists.

The following table presents the domains and the indicators comprising each. Note that in some cases, which domain is the correct location for an indicator is arguable, because of the interrelatedness of the issues (This table is reproduced from “Theme Report 1: Incomes, Shelter and Necessities,” FCM Quality of Life Reporting System, 2004).

7.6 Recent Reports

The 2004–2005 series of QOLRS reports comprised the following (All reports are found at www.fcm.ca/quality_of_life):

- “Highlights Report” – findings of particular significance across all issue areas;
- “Theme Report 1: Incomes, Shelter and Necessities” – a look at incomes and the affordability of living in the QOLRS communities, with emphasis on housing costs;

- “Theme Report 2: Dynamic Societies and Social Change” – an examination of the demographic forces and changes affecting the QOLRS communities, with emphasis on the description of high levels of immigration and diversity;
- “Theme Report 3: Growth, the Economy and the Urban Environment” – examining the rates of growth of the member communities, possible linkages to observed environmental conditions and efforts to mitigate environmental pressures.

Two special reports were also produced:

- “Falling Behind: Our Growing Income Gap” – this report described the general widening of income distribution in three of the QOLRS cities, and considered the implications of this general trend;
- “Ecological Footprints of Canadian Municipalities and Regions” – an analysis of the degree of usage, per capita, of natural resources in each of the QOLRS communities.

Overall, the 2004–2005 reports found that quality of life in the QOLRS municipalities was at risk, as pressures continue to mount on income, the environment and people living on the margins.

Despite improvements in rates of post-secondary education, employment growth and home-ownership, quality of life has deteriorated for a growing number of people. Improvements in income and poverty rates since 1996 have been offset by a growing income gap, housing affordability problems and changes to social programs.

With the burgeoning growth of most of the QOLRS members, it was not surprising to see evidence of pressure on the environment. Nevertheless, it was clear that municipalities were making progress on waste diversion rates and water treatment. It was similarly clear that urban transit will need to be expanded in order to change commuter vehicle use patterns and curb degradation of air quality.

7.7 Development Plans for the QOLRS: Future Directions

Given the context discussed above, and the strength of the existing QOLRS, FCM plans to expand the reach and scope of the system.

7.7.1 Membership

The current membership of 22 large cities and regional municipalities covers most of the major urban areas of Canada and the majority of Canada’s population. FCM is pursuing membership of the remaining large urban centers.

Secondly, FCM is pursuing the means to extend the reach of the system to smaller communities. This has been challenging to date, due to data restrictions for smaller geographic areas and populations in Statistics Canada’s products and due to resource constraints for FCM and potential participant municipalities. FCM plans to

participate in the work of a Community-University Research Alliance (Thompson Rivers University and the City of Kamloops) to develop indicators for smaller communities.

7.7.2 Indicators and Reports

FCM plans to extend the scope of the system's indicators to better cover certain aspects of quality of life and sustainability. Principal among the areas requiring improved and additional measures are environmental conditions, public health and cultural life.

With data spanning ten years and three Censuses, the QOLRS database already provides a unique long term perspective on trends in member communities. This will continue to grow in significance as more Census data points are added.

The indicator set, however, will also be revised and expanded to allow editions of the QOLRS report during the periods between releases of Census data, as well as research reports on selected topics. The result will be a yearly or bi-annual publishing schedule, with census-based reports going into more depth on demographic and socio-economic issues than the inter-Census reports, which will deal more with locally-measured conditions and municipal activities.

7.7.3 System Applications

FCM plans to investigate the potential application of the QOLRS and its network to the development of measures-based planning and management in municipal government. The QOLRS provides a set of output/outcome measures which are potentially of significant use in planning and in engaging with and reporting to citizens. Many municipalities, including the members of the QOLRS also collect and use process and performance measures in their planning and management decisions.

FCM recognizes that in several provinces, provincially-mandated performance reporting regimes already exist. In some cases, these provincially-designed and mandated programs may result in a net burden on municipal governments. This "top down" approach is not something to which FCM wishes to contribute.

Nevertheless, many larger municipalities are now applying measures-based management to their planning and operations of their own accord, recognizing this as a tool to make better decisions. In some cases, this is "performance management," which is primarily concerned with service outputs and their cost-effectiveness, for instance, the cost per mile of snow removal ("Measures-based management" in this discussion). FCM plans to document those processes and make them available to the municipal sector, and in particular, to smaller municipalities for whom this capability would be more difficult to develop. Significant utility would be offered by municipal-sector-generated tools to support planning, management and

accountability, combining quality of life, sustainability and process/performance measures.

A resource in this aspect of the project, relevant in particular to smaller municipalities, are the processes developed by the FCM International Center for Municipal Development to put in place measures-based management “from the ground up” for municipalities without the resources to do so.

7.8 Conclusion

The Quality of Life Reporting System is a key tool for the development of the ability of municipal governments to manage their way to both specific and broad quality of life goals. The system has been developed, and continues to be developed, with the informational requirements of the member municipalities foremost in mind, followed closely by practicality, ease of interpretation and data availability. While the connection of the system’s conceptual foundation and indicators to theoretical issues of both policy and methodology can be demonstrated, the continued development of the system will remain grounded in municipal experience and practice.

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Chapter 8

The Indices of Community Well-Being for Calgary Community Districts: A Neighborhood-Based Approach to Quality of Life Reporting

Derek Cook and John Te Linde

Abstract The Indices of Community Well-being is a municipal based indicators system that monitors changes in the well-being of Calgary's constituent communities (neighborhoods). Initially developed in response to a Council request to review the allocation of Social Services resources, the project has expanded in scope over the past twenty years. These changes have reflected changes in the approach to social services delivery, as well as a growing awareness of the value of community level social data for planning and decision making. As our understanding of, and commitment to, sustainability grows, there are opportunities to further develop this indicators system to integrate with other sustainability initiatives. At the same time, new forms of information dissemination are emerging to satisfy the growing demand for social data. Responding to these opportunities and challenges will provide new directions for innovation for this seminal report.

8.1 Context

The city of Calgary, located in the western Canadian province of Alberta, is currently home to a population of 1 million people. With an economy fueled largely by the oil and gas industry, the city has experienced robust economic and population growth over the past several decades, with the attendant social issues that such growth presents. In this context, the city and region have been faced with unique opportunities and challenges in the planning and delivery of services.

The city is governed by a Ward based elected Council that oversees the operations of The City of Calgary which is responsible for the delivery of a variety of municipal services. The responsibilities of The City have changed and evolved over the years,

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particularly with respect to the delivery of social services. Currently, The City has responsibility for a range of community services including parks, recreation, affordable housing, and community and neighborhood services. Specific program areas include youth probation, out-of-school care, youth employment, social service funding, research and planning, and community development services. Municipalities in Alberta, as distinct from other Canadian jurisdictions, do not have responsibility for the delivery of welfare services. Over the past couple of decades, The City has increasingly moved away from the direct delivery of social services to a facilitative role focused on planning and funding.

One of the unique features of Calgary is the fact that it is a uni-city. While there is an emerging metropolitan region, it is dominated by the city of Calgary, and the regional population remains largely rural. Consequently, The City has greater flexibility in the planning and delivery of services to the urban community as it is relatively unfettered by jurisdictional challenges that are prevalent in other large metropolitan regions. Also as a result of this governance feature, smaller neighborhoods (Community Districts) are an important feature of the urban landscape, with 190 residential Community Districts currently recognized for planning purposes. Most of these community districts have established Community Associations that partner with The City to provide recreational and other programs and services to their communities, while representing the community in planning and other matters.

The importance therefore of neighborhood based information has proven to be critical to planning and service delivery both for The City as well as for the myriad community associations, groups and social service agencies that deliver locally based programs and services. As the city grows, the need for community based programs and differentiated service based on community (neighborhood) needs and characteristics continues to increase. In this environment the need for small area data has been growing in importance as well.

8.2 The Indicators

The *Indices of Community Well-being* provides community (neighborhood) level social data to allow for a comparison of the well-being of communities relative to each other. The first report was produced in 1985 and was intended to provide an understanding of the needs of communities relative to the allocation of social services resources. Consequently, the selection of indicators was based on their relevance to the programs and services delivered by the Social Services Department at the time (see Table 8.1) rather than emerging from a rigorous theoretical construct of well-being. The indicators themselves were a mix of federal census data and service data, with the federal census being the primary data source. In order to standardize the data, the various indicators were converted to index values that reflected individual community value relative to the city as a whole.

The report has been replicated with each successive census since 1986. Over that time the indicators have changed and the conceptual framework refined (see

Table 8.1 Index of social services need for calgary wards, 1986

- Seniors living alone
- Seniors receiving the Guaranteed Income Supplement (GIS)
- Unemployed youth (15–24)
- Unemployed adults (25+)
- Lone-parent families
- Social assistance (welfare) recipients
- Persons living in low-income households
- Persons whose mother tongue is not english
- Home language is single non-official language
- Reported crimes
- Probation cases
- Owner-occupied dwellings
- Out of school care spaces

Table 8.1). As the mandate of the Social Services Department has changed, the selection of indicators has evolved from its original focus on factors relevant to service delivery, to a framework based to a greater extent on a typology that reflects a conceptual understanding of community well-being.

The 1996 report reflected a significant shift in approach as it introduced a conceptual framework as an organizing principle for the indicators. This report adopted a sustainability approach and organized the indicators according to their relevance to social, economic and physical well-being (see Table 8.2). This framework identified the social, economic and physical dimensions to sustainability. Each dimension then

Table 8.2 The indices of community well-being, 1996

Dimension	Theme	Indicator
<i>Economic well-being</i>	Poverty	Persons in low-income households Children in SFI (welfare) households Seniors receiving GIS
	Employment	Unemployed adults Unemployed youth
<i>Social well-being</i>	Family Stability	Lone parent families
	Social Inclusion	Recent movers Recent Immigrants Knowledge of official languages (English or French) Unattached individuals Seniors living alone
	Education	Persons not completing high school
	Housing	Renters Spending >30% of Income on Shelter Costs Families Below Housing Affordability Threshold Dwellings requiring major repair
<i>Physical well-being</i>	Personal Health	Hospital in-patients
	Personal Safety	Emergency room visits Person and property crimes

contained a variety of themes that were considered to contribute to well-being in each dimension. Indicators were then selected for each theme. While the framework attempts to provide a sustainability perspective, the physical well-being category remains admittedly weak as it focuses on indicators of the quality of the physical environment including health and safety rather than on the natural environment. However, the lack of available data for the natural environment at the community level restricts a fuller treatment of the environmental dimension of sustainability in the report.

Despite its shortcomings, the value in the adoption of a sustainability framework lies in its ability to justify the selection of indicators according to a defined concept of well-being unrelated to service provision. Further, it allows a refined analysis of well-being by providing the opportunity to compare communities based on the component dimensions, in addition to the higher level comparison of overall need based on the total complement of indicators. This conceptual framework has been maintained, being replicated and refined in the 2001 report.

8.3 Origins and Evolution of the Study

The *Indices of Community Well-being for Calgary Community Districts* has emerged as the fundamental reference document for neighborhood level social data. The study originated from a request from City Council to the Social Services Department (as it was known at that time) to justify the allocation of Social Services resources to the various City wards. The Social Services Department at that time provided neighborhood based social services including staff and resources in high needs areas. In 1985, a need arose to provide justification for the existing resource allocations for Aldermen who were competing for resources for their Wards.

In order to satisfy this Council request, a study was undertaken to assess the level of need in the various City Wards using a variety of indicators of social services need (See Table 8.1). In order to facilitate a city-wide comparison, an index was developed which expressed the indicator value for the Ward as a ratio of the city average. In order to provide an overall depiction of service need, the index values for the 13 indicators were averaged to allow for a comparison of average level of service need for each of the city's Wards. Similarly, the level of service provision for each City Ward was quantified and expressed as an index relative to the City average. This then permitted an examination of both service need and service provision across City Wards which, in turn allowed for the identification of Wards that were under-served relative to need.

The resulting report was very well received, and led to the reallocation of resources and the provision of additional resources for neighborhood based social services in identified high needs areas. The perceived value of the report was such that it was replicated using Community Districts (neighborhoods) as opposed to Wards as the unit of analysis. A debate accompanied the shift from a Ward to a community based review. This debate focused on the political and ethical ramifications of comparing communities based on social need. While need information

had previously been public, it had not been assembled in a manner that allowed for such comparisons, and that highlighted communities with elevated social needs. The utility of this information for service planning needed to be balanced against the potential for stigmatization of communities based on the data. There was also a concern about the potential political backlash against Aldermen from Wards and communities that were identified as high needs areas. In the end it was felt that the potential utility of the information outweighed the potential impacts, and the report was made public under the title of *The Indices of Social Services Need for Calgary Community Districts*. History has since proved that much of the worry over stigmatization and political backlash was not warranted.

In 1995, the report was replicated using 1991 Census data and the indicators were modified slightly. In 2000, the report was replicated again based on 1996 census data but renamed *The Indices of Community Well-being*. This change was reflective of a significant shift in The City's model of service delivery. In 1998, the Social Services Department was restructured and became the Department of Community and Social Development and signified a fundamental change in direction where The City moved away from direct delivery of Social Services to a community development approach focused on facilitating community action in conjunction with City administered funding for preventive social services by non-profit organizations. The 1996 report therefore reflected an approach to service delivery that was much more founded on partnerships. As a result, the indicators selected for inclusion in the report (See Table 8.2) are less tied to service data related to services provided directly by The City or that directly impact City delivered services.

As the responsibility for the delivery of social services shifted, the demand for neighborhood based data has grown. The value of the Indices document lies in its ability to deliver sound data for planning to small organizations that otherwise would be unable to afford to purchase or access such data on their own. The role of The City in providing such information is heightened in the case of Calgary which lacks a Social Planning Council. In the absence of a Social Planning Council, The City has provided similar information and planning services to the community through its Family and Community Support Services (FCSS) funding program, which also funds The City's Social Research Unit that produces the Indices report.

8.4 Evolving Uses of the Report

As the document has evolved over the past two decades, the users and uses of the report have likewise changed. As the emphasis of the original 1985 report shifted from the initial Ward focus to a community focus, the audience and usage of the report also shifted from City Council and senior administration, to front-line service delivery workers. The document remains a central information resource for internal City service planning. As the City's role in the delivery of service has evolved, however, the uses of the report have become more varied.

The emerging public nature of the report is perhaps the greatest evolution in use. As the role of The City has changed from direct delivery to a more facilitative one,

the role of the non-profit sector in the delivery of social service has grown. Consequently, there has been a growing need by community agencies for neighborhood level social data both for service planning as well as support and justification for funding applications. The document also provides important information guiding the allocation of social service funding by The City to social service agencies. The report therefore has shifted from a primarily internally focused report to Council to a public document that has gained importance as a community resource.

In addition to an ongoing and central role in social service planning, the report continues to be an important resource for City Council, as aldermen have an ongoing need to assess the priorities of residents in their respective Wards. The report has also emerged as an important resource for urban planners who need to understand the social characteristics of neighborhoods when undertaking major land use planning initiatives. Increasingly, business planners for various Departments within The City are also referring to the report to guide service planning for a variety of City administered programs and services besides social services for which the report was originally intended.

Finally, the report has proved to be useful for the private sector in Calgary as well. Real estate agents, for example, refer to the report when advising clients, particularly home buyers, on preferred locations. This may have the unintended effect of influencing real estate decisions and biasing the market away from areas identified as “high needs”. Businesses, primarily small businesses, have also used the report in evaluating preferred business locations. There may as well be other uses to which the report is put of which we are unaware.

8.5 Methodology

The purpose of the *Indices of Community Well-Being* is to provide relevant information regarding the key dimensions of the well-being of Calgary’s communities to assist community leaders and service providers in identifying strengths and needs within their own communities. The *Indices of Community Well-Being* report is intended primarily to:

- Provide relevant data to identify incidence and prevalence of selected social problems for communities and for particular at risk groups within the community.
- Provide data on key social and economic indicators to inform program planners and policy makers in the City of Calgary and the community.
- Provide a measure of the well-being of Calgary communities relative to other communities and the city as a whole.

Calgary communities are evaluated based on both incidence and prevalence of the various indicators. Both incidence and prevalence are expressed as index values. For this study, two types of indices were constructed: an Index of Volume (INV), and

an Index of Risk (INR). The report does not attempt to weight any of the indicators, and therefore assigns each indicator equal weight. In the early development of the report, methods to assign weights were explored, but ultimately the complexity and challenges of doing so outweighed the potential methodological benefits.

The Index of Volume (INV) measures the number (or prevalence) of individuals that experience a particular indicator for a particular community. The INV is constructed by summing the number of indicator experiences in each community and dividing by the number of communities to produce a Calgary average. Individual community INV scores may then be interpreted by comparing them to the average INV score, which has been set to a par value of “0”.

$$INV = (n/a) - 1$$

where n = the number of indicator experiences for each community and a = the average for all communities.

The Index of Risk (INR) measures the percentage (or incidence) of individuals that experience a particular indicator for a particular community. The INR is constructed by calculating the percentage of individuals experiencing an indicator for a given community as well as for the city as a whole. The percentage for each community is then divided by the percentage for the city to produce the INR score. Individual community INR scores can be interpreted by comparing them to the average INR score, which has been set to a par value of “0”.

$$INR = ((n/p) * 100/r) - 1$$

where n = the number of cases for each community, p = the population for each community, and r = the rate for all communities.

In order to help the reader determine which community districts have the greatest volume and risk of the specified indicators, each community is ranked against all other communities according to its INV and INR scores. Ranking on both scores proceeds from highest score to lowest, with a rank of “1” identifying the community with the highest number/percentage of individuals experiencing the indicator.

In order to provide a summary of the data for the city as a whole, an average Index of Volume (INV) is calculated by summing the INV scores for each variable for each community, and dividing by the number of variables. Community Districts are then ranked according to their average INV scores. The resulting average INV identifies communities with the greatest number of individuals experiencing the indicators utilized in the report.

Finally, recognizing that community well-being is a function of both the *number* of individuals in a community experiencing need, as well as the *percentage*, a classification system was developed to classify communities according to both factors. This classification system results in an overall community vulnerability rating. This is accomplished by summing the INV and INR rank for each indicator (see Table 8.3 for an example):

Table 8.3 An example

		INV	Rank	INR	Rank
Community X	Variable 1	2.3	7	1.3	13
	Variable 2	0.8	23	0.5	41
	Variable 3	1.2	14	1.8	9
	Variable 4	-0.5	65	0.9	73
	TOTAL	na	109	na	136

Communities are then ordered according to their total INV and INR ranks from lowest rank score to highest; the lower the score, the lower the need in the community. The INV and INR lists are then divided into quintiles and Communities classified according to the quintile range into which they fall, providing a typology (below). Communities that fall within the top two quintiles on both the INV and INR rank scores are classified as high-volume and high-risk. Communities that rank within the top two quintiles on the INV and in the bottom three quintiles on the INR rank scores are classified as high-volume, low-risk. Communities that rank within the bottom three quintiles on the INV and within the top two quintiles on the INR total rank scores are classified as high-risk, low-volume. Communities that rank within the bottom three quintiles on both the INV and INR total rank scores are classified as low-volume, low-risk.

Finally, in order to give the reader a visual appreciation of how need and risk are distributed across the city, maps are prepared for each indicator. Figures 8.1, 8.2, 8.3, and 8.4 provide examples. Figures 8.1 and 8.2 depict INV and INR scores for communities based on a low-income indicator. Figures 8.3 and 8.4 are 2 aggregate maps depicting the average INV scores for each community and the levels of community vulnerability (Table 8.4).

Table 8.4 Community vulnerability typology

		Risk (INR) Rate of people experiencing need	
		High (Top 2 quintiles)	Low (Bottom 3 quintiles)
Volume (INV)			
Number of people experiencing need	High (Top 2 quintiles)	Highly Vulnerable (High Volume/High Risk)	Moderately Vulnerable (High Volume/Low Risk)
	Low (Bottom 3 quintiles)	Moderately Vulnerable (Low Volume/High Risk)	Least Vulnerable (Low Volume/Low Risk)

8.6 Limitations of the Report

There are several limitations of the methodology that has been developed for the report. First, although the report has been renamed *The Indices of Community Well-being* to reflect a stronger sustainability emphasis, it remains essentially a needs

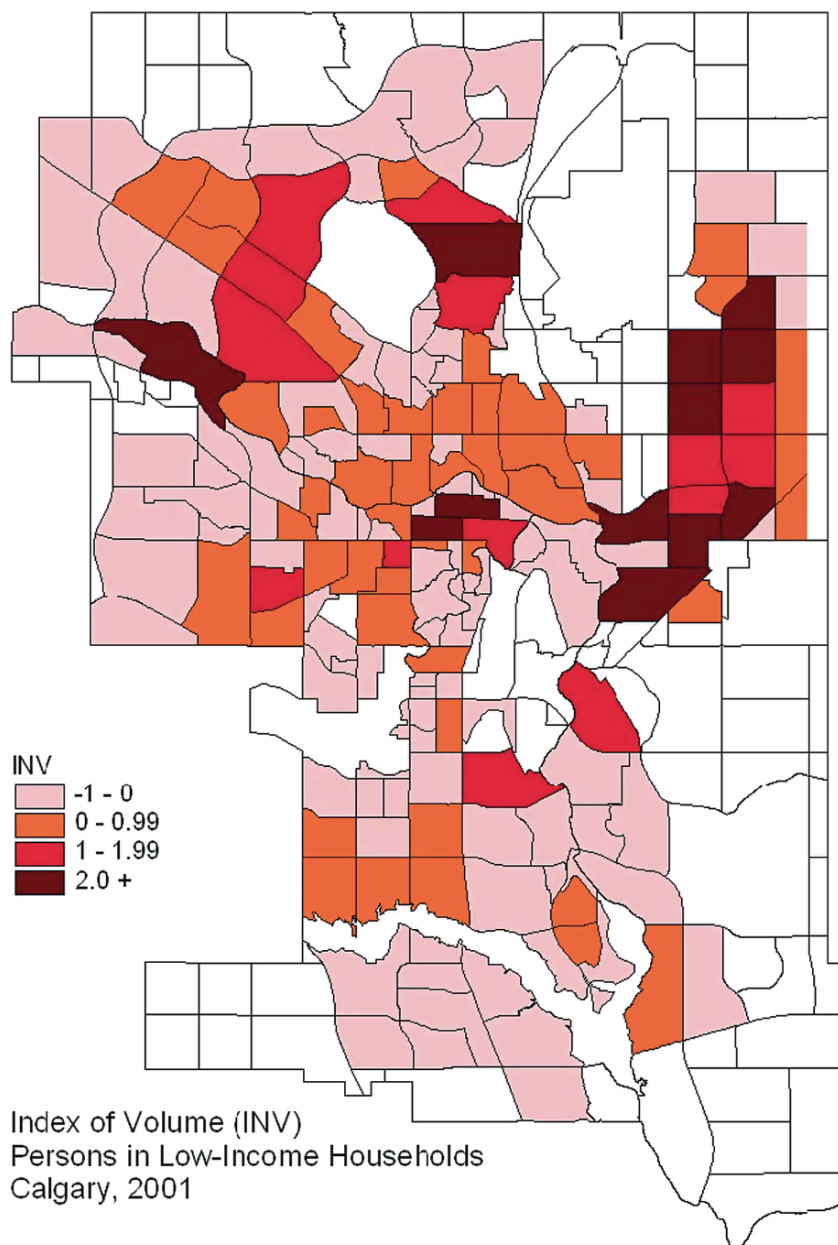


Fig. 8.1 Sample INV map

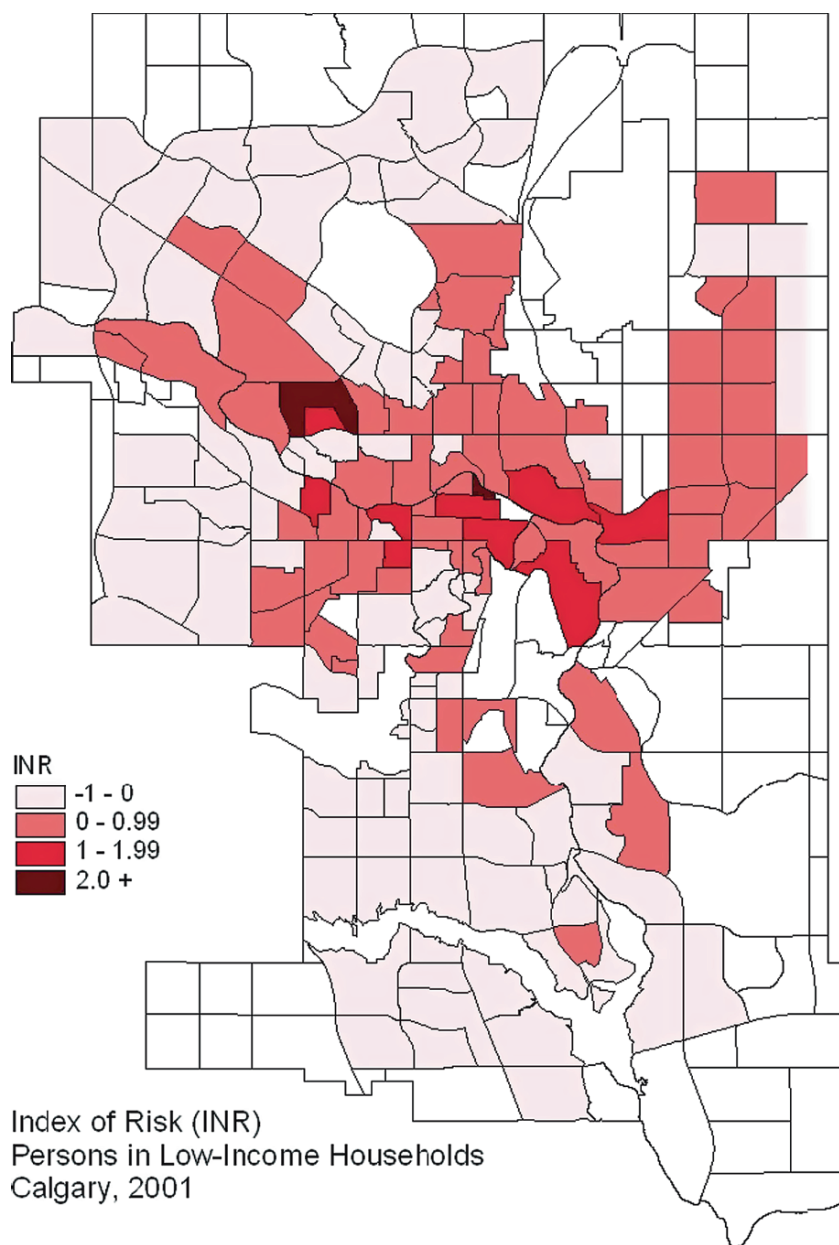


Fig. 8.2 Sample INR map

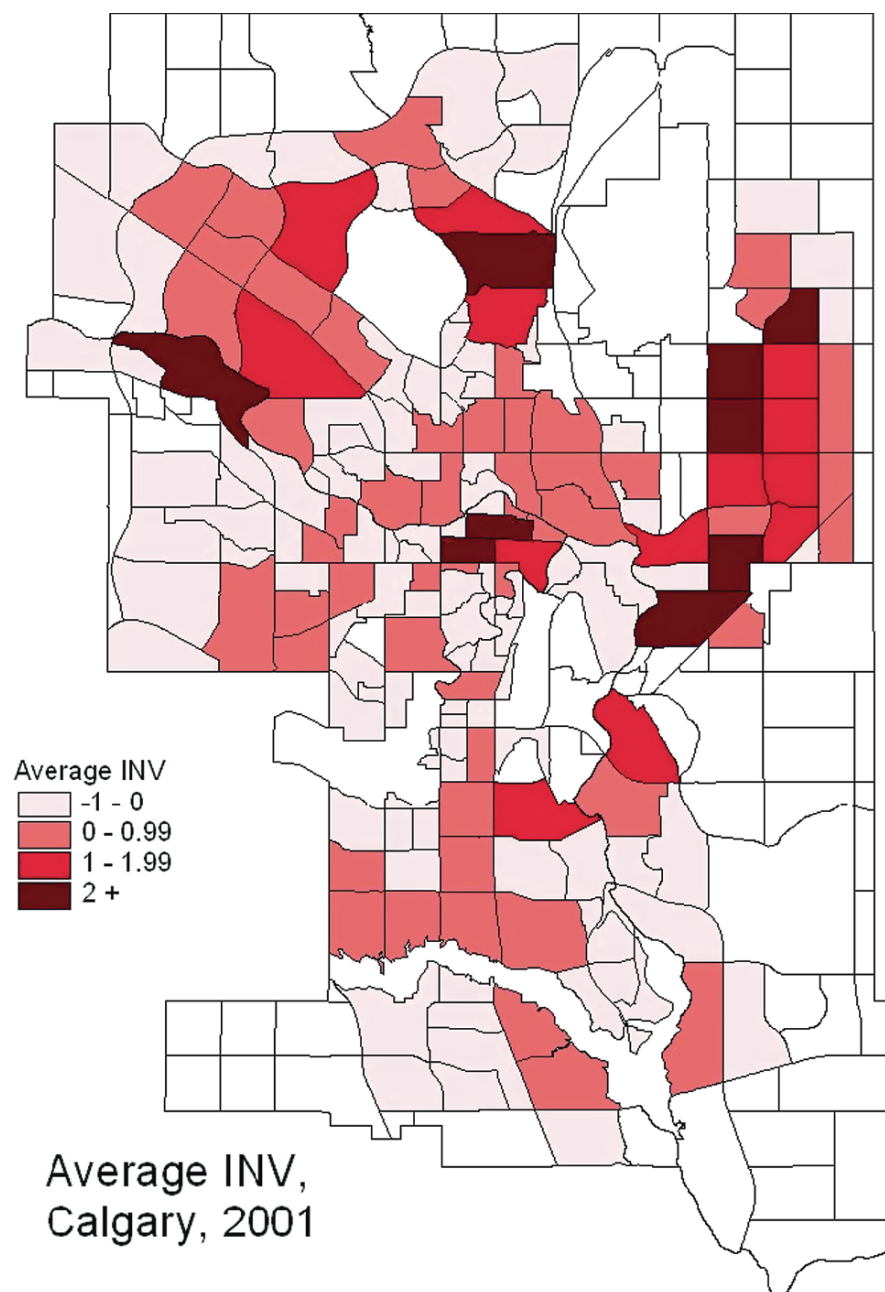


Fig. 8.3 Sample map – average INV

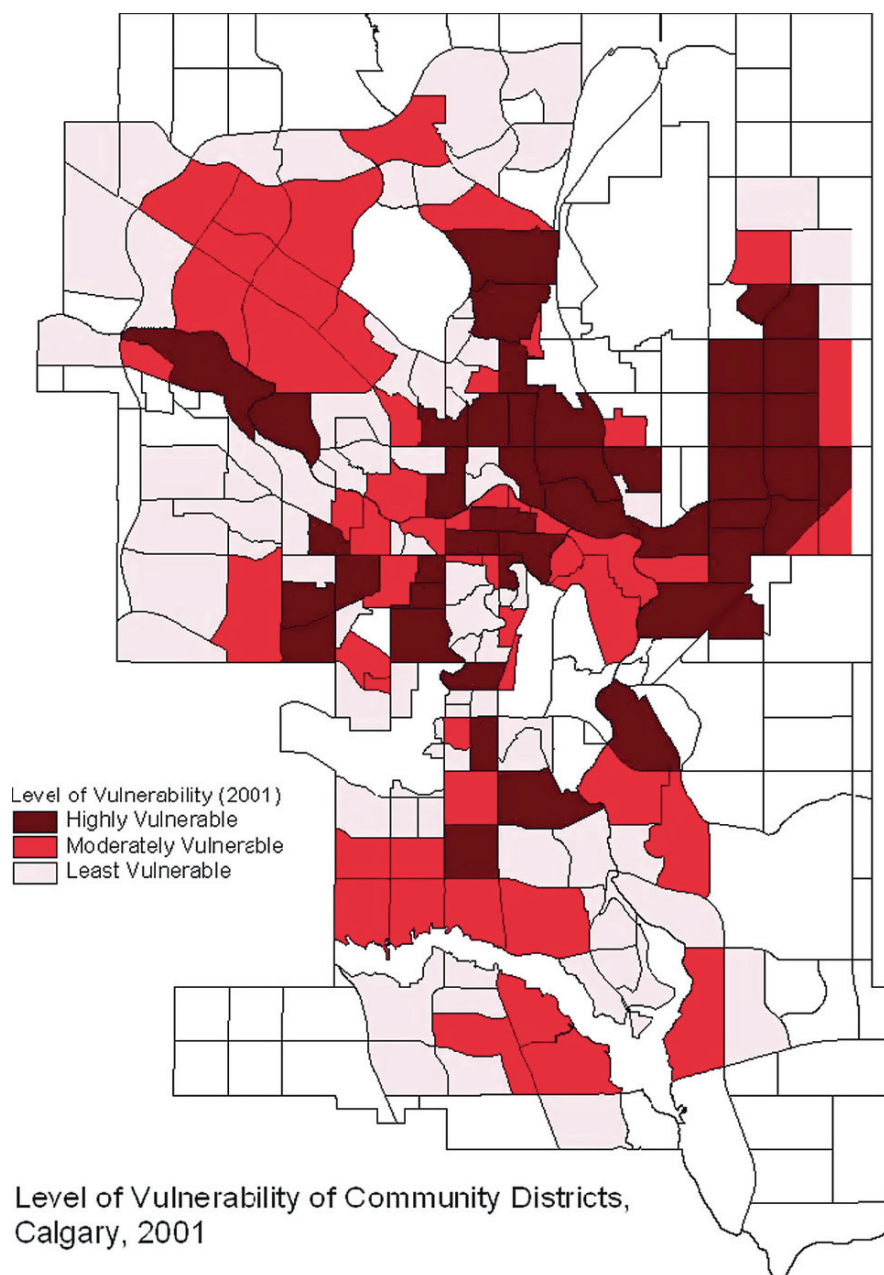


Fig. 8.4 Sample map – community vulnerability

based (deficit) approach rather than an asset-based approach. Further, without a clear definition of “well-being”, the extent to which a community approaches such a state cannot be determined by the Indices. This limitation emerges largely as a result of the origins of the report, as it was developed to guide service delivery rather than evaluate communities against concepts of well-being or sustainability.

As a service-oriented reporting system, therefore, similar concepts tend to be reported multiple times. For example, separately reporting youth and adult unemployment disproportionately weights unemployment in the system. Similarly, reporting on low-income as well as the number of recipients of social assistance and seniors benefits results in double-counting and disproportionately weights poverty in the system. This implicit weighting and the lack of a developed and explicit weighting system limits the methodology as it applies to the development of cumulative indices.

While the report attempts to further thinking about well-being and sustainability at the community level, there is a lack of community level data that would be necessary to construct a true sustainability index. Environmental data, for example, is not only not available at that level, but potentially meaningless at that geographic scale as well. Further, there is little ability to capture community assets, nor would asset based data integrate easily into a methodology which is based on a ranking of needs. Consequently, the report continues to perhaps unfairly label communities as “high needs” while ignoring the many assets in those communities that contribute to community well-being and sustainability.

Finally, as the report relies heavily on federal Census data, the timing of the Census dictates the production of the report. Also, as federal Census geography does not correspond to City defined neighborhoods, The City is required to purchase custom tabulated Census data in order to conduct this neighborhood based analysis. This not only increases the cost of the data, but also increases the lag time between the release of the Census and the development of the report. There has tended to be a three year delay between Census day and the report’s release. This compromises the utility of the report somewhat, particularly in the case of Calgary, as it experiences rapid changes in its urban social geography.

8.7 Future Directions

Despite the limitations of the methodology as a sustainability reporting system, the need for sustainability reporting is continuing to grow within The City of Calgary. In 2003, The City adopted a “Triple Bottom Line” approach requiring that social, economic and environmental impacts and benefits be considered in all City planning and decision-making. Implicit in such an approach is a need for the data by which to evaluate such impacts, often at the community (neighborhood) level.

In 2005, The City of Calgary also embarked on a substantial sustainability initiative called imagine Calgary. This initiative aims to develop a long-term vision and plan for sustainability that will inform all City planning documents and processes,

most importantly the Municipal Development Plan. In order to measure progress with respect to the achievement of the Plan's objectives, a sustainability reporting system will be required. The Indices may prove to be an important element of any system that may be subsequently developed.

There is also a growing perception that social data is increasingly necessary in order to support the case for investments in social infrastructure. In a climate of rapid urban growth, resources tend to be allocated to physical infrastructure to alleviate growth pressures on existing infrastructure. The rationale for such investments is often based on empirical data that clearly demonstrates need. More and more, service providers and policy makers in the social arena are relying on similar and increasingly sophisticated measures of the capacity and stresses on the community's social infrastructure in order to justify investments in this area.

As the need for social data grows, the technologies available to deliver such information are also changing. The *Indices of Community Well-being* was developed in an era where access to data was limited, and what was available was primarily, or exclusively, in hard copy. Today, planners and service providers have available a wider array of data in multiple formats. Consequently, the relative importance of the *Indices of Community Well-being* for service planning may be declining as planners have access to more data resources, particularly electronic.

Report users are also themselves becoming increasingly sophisticated in the use and interpretation of social data. Increasingly, users are demanding the ability to access the raw data and conduct their own analysis and create their own geographies based on their service delivery areas. New partnerships and technologies for sharing data thus pose a challenge and a potential avenue of evolution for this report which has become the central document for social service planning in Calgary.

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- Amarillo and Canyon Counties: The Community Report. <http://www.unitedwayama.org>
- Anchorage: Healthy Anchorage Indicators. <http://www.indicators.ak.org/>
- Archuleta, Dolores, La Plata, Montezuma, and San Juan Counties: Pathways to Healthier Communities. <http://www.operationhealthycommunities.org/path.html>
- Austin (City of): Sustainable Community Initiatives. <http://www.ci.austin.tx.us/sustainable/history>
- Baltimore: Vital Signs of Baltimore Neighborhood Indicators Alliance. <http://www.bnaia.org/pdf/ALL.printed2.pdf>
- Boston Indicators project. <http://www.tbf.org/indicators>
- Boulder (City of): Sustainability Indicators Project. http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=3545&Itemid=1713
- Boulder County: Community Indicators Report. <http://www.bococivicforum.org/publications.html>
- Burlington Legacy Indicators Project (<http://maps.vcgi.org/burlingtonlegacy/>)
- Calgary (City of): FCM Quality of Life Reporting System. http://www.calgary.ca/portal/server.pt/gateway/PTARGS.0.2.402874.0.0_18/fcm-quality_life.pdf
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- Los Angeles State of the County. <http://www.unitedwayla.org> and http://www.unitedwayla.org/pages/rpts_resource/rpts_resource.html
- Minneapolis Sustainability Roundtable. <http://crworks.org/msi/indicators.pdf> and <http://crworks.org/guide.pdf>
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- Pasadena/Altadena Healthy Cities Project. http://www.ci.pasadena.ca.ca.us/publichealth/pphd_home/qualityoflife/qualitylife.asp
- Portland Multnomah Progress Board. <http://www.p-m-benchmarks.org/tblcnts.html>
- Routt and Moffatt Counties: Yampa Valley Partners Community Indicators Project. <http://www.yampavalleypartners.com>
- San Diego Sustainable Community Program. <http://www.sandiego.gov/environmental-services/sustainable/index.shtml>
- San Jose: The Community Impact Report. <http://www.wpusa.org/publications>
- San Mateo: Sustainable San Mateo County. <http://www.sustainableanmateo.org>
- Santa Barbara Economic Community Project. <http://www.sbcecp.org>
- Santa Cruz Community Assessment Project. http://www.unitedwaysc.org/projects_cap.html
- Santa Monica Sustainable City Plan. <http://pen.ci.santa-monica.ca.us/epd/index.htm>
- Seattle: Sustainable Seattle. <http://www.sustainableseattle.org/Programs/RegionalIndicators>
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