**PLANNING CONNECTED: USING ONLINE SOCIAL NETWORKS TO
IMPROVE KNOWLEDGE ABOUT PLACES AND COMMUNITIES**

A Thesis
presented to
the Faculty of California Polytechnic State University,
San Luis Obispo

In Partial Fulfillment
of the Requirements for the Degree
Master of City and Regional Planning

by
Aaron Parker Ray
June 2011

© 2011
Aaron Parker Ray
Some Rights Reserved

**This work is licensed under a Creative Commons
Attribution-NonCommercial-ShareAlike license.**

License deed: <http://creativecommons.org/licenses/by-nc-sa/3.0/>
License legal terms: <http://creativecommons.org/licenses/by-nc-sa/3.0/legalcode>

COMMITTEE MEMBERSHIP

TITLE: Planning Connected: Using Online Social Networks to
Improve Knowledge about Places and Communities

AUTHOR: Aaron Parker Ray

DATE SUBMITTED: June 2011

COMMITTEE CHAIR: Umut Toker, Ph.D.
Associate Professor, City and Regional Planning
California Polytechnic State University

COMMITTEE MEMBER: Michael Boswell, Ph.D., AICP
Professor, City and Regional Planning
California Polytechnic State University

COMMITTEE MEMBER: Hemalata C. Dandekar, Ph.D.
Professor and Department Chair, City and Regional Planning
California Polytechnic State University

ABSTRACT

Planning Connected: Using Online Social Networks to Improve Knowledge about Places and Communities

Aaron Parker Ray

The advent of Social Networking Systems (SNS) has introduced new possibilities for planners to refine and extend conventional engagement and data-gathering techniques by leveraging user-contributed, spatially-referenced content freely available online. This study examines the use of SNS content as community input, complementing input gathered through traditional participatory processes such as workshops, public comment hearings, and charrettes. Four case studies of recent community planning projects in the United States are analyzed, comparing the data gathered from traditional participatory processes with available SNS content related to each project study area, to determine to what extent the inclusion of SNS data would improve the overall data-gathering efforts of these projects. Three significant findings emerge from this analysis: (i) that SNS data analysis can positively complement data gathered from traditional participatory processes, (ii) that although SNS data analysis can provide useful data to planners, it is not a direct replacement for conventional engagement techniques, and (iii) that SNS data analysis is most effective for projects in neighborhoods with a well-defined identity. The study also examines the characteristics of effective SNS data analysis integration and discusses broader implications for planning practitioners and additional research needed.

Keywords: social networking, planning research, emerging technologies in planning, spatially-referenced data, community engagement, participatory techniques

ACKNOWLEDGEMENTS

It is impossible to acknowledge here all those who supported my work towards completion of this project, but I wish to specifically thank those without whom this research would not have been possible.

First and foremost, I want to thank Thomas G. Layton, one of my teachers at South Eugene High School, for instilling in me the spirit of lifelong learning and curiosity without which my academic pursuits would not have occurred. Tom was the first to show me that what one knows is often not nearly as vital as what one can discover, through perseverance, creativity, and thinking beyond what conventional wisdom holds.

I am very grateful for the support of my committee chair, Dr. Umut Toker, for helping me explore a realm of planning that has not yet been thoroughly examined. He and my committee members, Drs. Michael Boswell and Hemalata Dandekar, helped focus my research and motivation toward the completion of a study which I believe is just the first step toward an important future area of emphasis for planning practitioners.

I also wish to thank my cohort peers in the City and Regional Planning Department at Cal Poly for providing the academic inspiration and camaraderie necessary to complete this project. My peers have provided me with the support and encouragement to think creatively about my research, and I know that these friendships will endure as we transition into our next endeavors.

Finally, and most importantly, I am extraordinarily honored and fortunate to have had the strong and unwavering support of family and friends, who made it possible for me to return to school and complete my undergraduate and graduate studies. Their support, understanding, patience, and trust helped me to remain focused and work to the highest level of my abilities. I will be forever grateful to them, in particular my parents Evelyn, Jim, and Gerald; my sister Jennifer; and my partner Jeffery. I cannot thank them enough, and I wish to dedicate this thesis to all of them.

TABLE OF CONTENTS

LIST OF TABLES	ix
LIST OF FIGURES	xi
1 INTRODUCTION	1
2 LITERATURE REVIEW	4
2.1. Methods and shortcomings of contemporary planning data gathering and research	4
2.2. Challenges and benefits of integrating technology into traditional planning data gathering and research.....	7
2.3. Methods and problems related to the programmatic aggregation and analysis of user-generated SNS content	10
2.4. Emerging techniques and challenges involving the application of spatially-referenced SNS content analysis and mobile technologies to solve specific problems.....	13
2.5. Summary.....	16
3 METHODOLOGY	18
3.1. Research Questions.....	18
3.2. Methodology	19
3.3. Operationalization of Terms.....	20
3.4. SNS platform and data type identification and selection rubric	22
3.4.1. SNS platform selections	22
3.4.2. Flickr	23
3.4.3. Yelp.....	24
3.5. Case identification and selection.....	25
3.5.1. Case study selections.....	27
3.6. Data collection protocol.....	28
3.7. Data analysis.....	30
4 CASE STUDY ANALYSIS AND FINDINGS	32
4.1. Lyn-Lake Small Area Plan.....	33
4.1.1. SNS data gathering and initial analysis	35
4.1.2. Relationship between SNS-gathered and conventionally-gathered input.....	38
4.1.3. Reflections of community input in the Plan document.....	40

4.2. East End-Lexington Small Area Plan	41
4.2.1. SNS data gathering and initial analysis	43
4.2.2. Relationship between SNS-gathered and conventionally-gathered input.....	46
4.2.3. Reflections of community input in the Plan document.....	47
4.3. Cathedral Park Master Plan (Portland, Oregon)	48
4.3.1. SNS data gathering and initial analysis	51
4.3.2. Relationship between SNS-gathered and conventionally-gathered input.....	54
4.3.3. Reflections of community input in the Plan document.....	56
4.4. Downtown Morro Bay (California) Enhancement Project (Phase I).....	57
4.4.1. SNS data gathering and initial analysis	59
4.4.2. Relationship between SNS-gathered and conventionally-gathered input.....	62
4.4.3. Reflections of community input in the Plan document.....	64
4.5. Summary.....	65
5 CROSS-CASE ANALYSIS AND FINDINGS	66
5.1. Overall SNS data volume and tag instances	66
5.2. Volume of SNS data not necessarily related to the geographic size of the project area.....	71
5.3. Textual SNS tends to discuss multiple topics.	71
5.4. Textual SNS more likely to reveal challenges or negative feedback.	72
5.5. Demographic analysis was not possible due to limited data available	74
5.6. Volume of SNS data appears to be related to the imageability and defined identity of project areas.	74
5.7. SNS data appears to add detail about specific uses and activities within an area that may otherwise be assumed within planning data gathering	76
5.8. Important topical themes derived from SNS analysis are not always addressed in final plan language	77
5.9. Summary.....	81
6 CONCLUSIONS AND IMPLICATIONS.....	82
6.1. Key Conclusions	82
6.1.1. SNS data appear to complement traditionally-gathered community input.....	83
6.1.2. SNS data gathering is not a replacement for traditional engagement techniques.	84
6.1.3. SNS data analysis is most effective in areas with a well-defined identity.	85

6.2. Key Implications and Future Directions	87
6.2.1. Planners should begin to consider SNS data analysis in community engagement efforts.....	87
6.2.2. SNS technology competency and ongoing awareness need to be embraced as core professional skills.	88
6.2.3. Further research is required to more fully understand how emerging technologies can be better integrated into planning practice.	89
6.3. Closing	90
BIBLIOGRAPHY	91

LIST OF TABLES

Table 3-1. List of candidate case studies.....	28
Table 4-1. Content tag frequencies in SNS data gathered for the Lyn-Lake area.	36
Table 4-2. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Lyn Lake.	39
Table 4-3. Extent to which themes identified in SNS data were discussed in final language in the Lyn-Lake Small Area Plan.	40
Table 4-4. Content tag frequencies in SNS data gathered for the Lexington-East End area.	44
Table 4-5. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Lexington-East End.....	47
Table 4-6. Extent to which themes identified in SNS data were discussed in final language in the Lexington-East End Small Area Plan.....	47
Table 4-7. Content tag frequencies in SNS data gathered for the Cathedral Park area.	52
Table 4-8. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Cathedral Park.	55
Table 4-9. Extent to which themes identified in SNS data were discussed in final language of the Cathedral Park Master Plan.	56
Table 4-10. Content tag frequencies in SNS data gathered for Downtown Morro Bay.	60
Table 4-11. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Downtown Morro Bay.	63
Table 4-12. Extent to which themes identified in SNS data were discussed in final language in Downtown Morro Bay plan alternatives.	64
Table 5-1. Total volume of image and text data found in SNS searches across all four case studies.....	67
Table 5-2. Frequency of tags across all data and all case studies.	68
Table 5-3. Comparison of project area geographic size and number of data points per acre.	71

Table 5-4. Average number of tags per data point by data type.....	72
Table 5-5. Tag frequencies for negative topics across all cases.	73
Table 5-6. Classification of SNS Topics in each Case Study.....	79

LIST OF FIGURES

Figure 4-1. Overview of case study locations.	32
Figure 4-2. Map of Lyn-Lake Small Area Plan project area.....	34
Figure 4-3. Flickr image showing graffiti art murals in the Lyn Lake neighborhood.....	37
Figure 4-4. Flickr image showing crowds at a local community event.....	37
Figure 4-5. Flickr image showing detail of graffiti art mural.	38
Figure 4-6. Flickr image showing local bicycle resources in the Lyn Lake neighborhood.....	38
Figure 4-7. Map of Lexington-East End Small Area Plan project area.....	42
Figure 4-8. Example of art in Thoroughbred Park.	45
Figure 4-9. Example of sculptures in Thoroughbred Park.....	45
Figure 4-10. Flickr image showing built environment adjacent to the study area.....	46
Figure 4-11. Flickr image of cemetery markers within the study area.....	46
Figure 4-12. Map of Cathedral Park Master Plan project area.....	49
Figure 4-13. Flickr image showing adults and children attending a musical event in Cathedral Park.	53
Figure 4-14. Flickr image of park users socializing.	53
Figure 4-15. Flickr image showing the St. Johns Bridge and adjacent bicycle trails.....	54
Figure 4-16. Flickr image of attendees of the Portland Pirate Festival, an annual event in Cathedral Park.....	54
Figure 4-17. Map of Downtown Morro Bay Enhancement Project area.....	58
Figure 4-18. Driver in annual classic car event in Downtown Morro Bay.....	61
Figure 4-19. Sunset view of Morro Rock from Downtown Morro Bay.	61
Figure 4-20. Skateboarder event participant in Downtown Morro Bay.....	61
Figure 4-21. Men cleaning fish at the weekly Farmers' Market in Downtown Morro Bay.	62

1 INTRODUCTION

The use of social networking technologies has exploded in the past decade, with millions of people around the world using various social networking services (SNS) to communicate with friends, colleagues, and the world at large. More recently, the explosion of mobile communications and smartphones has combined SNS communication with the more recent ability to tie these communications to specific places through the use of georeferencing systems powered by the Global Positioning System constellation of satellites. Spatially-associated and/or georeferenced SNS systems allow people to express themselves, at little or no cost, asynchronously, for the world to see, in a way explicitly associated with place.

Planners have begun to recognize the value of SNS technologies as communication, awareness, and publicity tools, often with the intention of expanding the realm of participation engagement in local communities. While SNS technologies have shown to be effective tools for communication and interaction between planners and the general public in many cases (Steins & Stephens, 2008), the use of SNS content streams as data sources in planning research has remained largely unexplored to date. The large and expanding online corpus of user-generated, spatially-associated

content within SNS platforms could make these technologies valuable research data sources for planners, as a sort of unobtrusive observational tool. Leveraging these data sources could help to bring new types of information into decision-making processes and potentially diversify the range of community members providing input into planning deliberations.

This study explores this potential and its feasibility for application in the context of planning and community engagement in concert with existing data gathering techniques. To achieve these goals, this study compares data available from SNS platforms with those collected using more traditional data-gathering processes in four case studies of public spaces in the United States where recent participatory planning projects have been implemented. This study considers the types of data that could be gathered, their potential benefit to participatory processes, challenges and constraints facing these techniques, and implications for the practice in general. Topics for further research and development related to these techniques will also be suggested.

The goal of this research is to determine the practical and productive benefits of SNS data application within the practice today, or to at least raise the issue of including consideration of SNS user-generated context in planning research and data-gathering endeavors in the future. Clearly, social networking is not a passing fad or phenomenon in today's society – the use of mobile devices to communicate asynchronously will continue to expand as mobile technologies continue to penetrate everyday communications around the world. In the future, an increasing volume of this communication will be spatially-referenced to some extent.

Although planners have strived to expand the scope of participation within community workshops and other participatory activities, more progress is needed to incorporate segments of the community that continue to be underrepresented. Initial

steps by planners to embrace social media are a step in the right direction, although few planners are using SNS platform technology in a bidirectional and open manner. Technical awareness and technical competency of practitioners are common barriers to more widespread use of SNS technologies, but contemporary paradigms of epistemology and fundamental definitions of “participation” also warrant examination to maintain the relevance of the practice in the eyes of the broader community. One of the outcomes of this research could be to provide a rationale for this introspection by demonstrating what the outcomes of more intensive SNS use in the practice could be.

The practical implications of this communication shift have already shown themselves to be significant in other contexts, and the field of city and regional planning should be no exception. Although it is true that this research is quite early in the evolution of these technologies, the aim of this project is to demonstrate that SNS content should be a consideration for planning research and data-gathering in the future, especially as the use of new technologies continues to evolve within in the practice.

2 LITERATURE REVIEW

Previous research in this area relates to four primary foci: (i) methods and shortcomings of contemporary planning data gathering and research; (ii) challenges and benefits of integrating technology into traditional planning data gathering and research; (iii) methods and problems related to the programmatic aggregation and analysis of user-generated SNS content; and, (iv) emerging techniques and challenges involving the application of spatially-referenced SNS content and mobile technologies to solve specific problems. Each of these is discussed in additional detail in the following sections.

2.1. Methods and shortcomings of contemporary planning data gathering and research

Despite much progress made over prior decades to expand the realm of community participation, engagement, and knowledge in mainstream planning processes, practitioners continue to struggle with the institutional design of these processes to build a corpus of knowledge that can be reliably authentic in terms of the community in which they exist (Agger & Löfgren, 2008). Much of the introspection that has occurred has concerned identifying means of improving participation in traditional, explicit public engagement methods such as neighborhood meetings, forums, advisory

groups, surveys, and focus groups (Wang, 2001). Although it is generally accepted that broad public participation often yields better decisions (Sanoff, 2006), this participation is often not truly representative of the community in both demographic and political terms, which can challenge popular views of the process' legitimacy and lead to perceptions of manipulation or intentional exclusion (Wang & Wan, 2007).

Outside of explicit community engagement, planners rely heavily on surveillance techniques utilizing direct and indirect observation of individuals within public spaces to build knowledge about places and how they are used. Through these observations, planners strive to detect trends that provide insight into user activities and behaviors, social interaction, circulation and wayfinding, activity generators, and unfulfilled user needs within places (Zeisel, 1981). To maintain the integrity of these activities, it is necessary for planners to engage as a "marginal participant" (Zeisel, 1981, p. 119), minimizing interaction with those observed. Thus, knowledge gained from these activities is derived from planners' perceptions of participant behavior, rather than explicitly contributed by the participants themselves. This can call into question the underlying epistemology of planning knowledge in local contexts, which some believe are inappropriately constrained to knowledge gained through institutional processes and sanctioned government activities (Sandercock, 1998).

More recently, some local governments have responded to these epistemological dilemmas by changing their approach toward community engagement. In some cases, cities have adopted unconventional or experimental techniques to expand the realm of engagement within a community. Some of these techniques include engaging the community in the design of the participatory process itself, including the identification of research questions and the design of instruments or activities used in the data-gathering process (City of Portland, 2007), as well as

evaluation of the overall process and identification of lessons learned to improve future efforts (McManus, 2010).

As one example, the City of Portland, Oregon implemented a number of unconventional participatory approaches in its 2006 visionPDX community visioning project. The intent of the project was to identify and refine a set of long-term visions and broad goals to guide a subsequent project to update the City's comprehensive plan. The visioning process was oriented around three goals: "(1) Create ownership, over simply creating 'buy-in'; (2) Start from where people are in terms of readiness for the engagement activity; and, (3) Tailor the engagement to what best speaks to the targeted audience" (City of Portland, 2007, p. 42). To implement the visioning process, the City made small grants to 29 local organizations, who then designed and implemented their own engagement activities, which included a number of unconventional events including a planning-oriented musical play performed by a local theatre troupe and elementary school classroom activities to elicit input from children (City of Portland, 2007). As a result, the City was able to achieve a much higher participation rate from segments of the population that were often underrepresented in prior efforts (Murphy, 2007).

These new approaches bring with them their own challenges, some of the most significant being higher costs to complete projects and the additional time needed to deliver fruitful results. The popular press has framed some of these projects as being extravagant or unnecessary (Murphy, 2007), and even some in the planning academy have questioned the wisdom of sharing power with the community in the design of participatory processes, arguing that these open-ended processes deliver less actionable information than more conventional processes (Mitchell, 2007).

Emerging and experimental approaches are also more often employed as a component of larger-scale planning programs, such updating a region's comprehensive or general plan, as was the case with visionPDX, rather than in smaller projects at the master or specific plan level. Some cities have standardized processes that are used to develop all smaller-scale plans, with pre-defined project phasing, community participation methods, and data analysis techniques (City of Denver, 2002; City of Tulsa, 2010). These standardized processes could restrict the extent to which practitioners are able to employ emerging and experimental techniques in their work.

Even where experimental approaches have expanded the scope of engagement of the community in participatory planning processes, there is some debate as to the fundamental design of many contemporary processes and the extent to which they can be genuinely considered participatory. Although some contemporary design movements (new urbanism, for example) have outwardly embraced community participation as a central tenet of their design philosophy, the actual engagement of community input in decision-making is actually quite limited in many cases (Toker & Toker, 2006). The key lesson in this case is that experimental engagement methods are not necessarily more participatory in and of themselves, and that planners may maintain an inappropriate level of propriety within the decision-making process despite innovative or experimental approaches to engage the broader public.

2.2. Challenges and benefits of integrating technology into traditional planning data gathering and research

Participatory processes that include technology-facilitated components have shown, in some cases, to attract higher rates of participation from young adults than

more traditional engagement methods, when designed and integrated into other participatory activities appropriately (Gordon & Manosevitch, 2010). Planners have increasingly turned to technological aids to improve the efficacy of existing participatory processes, with varying degrees of success. In most cases, technology has been applied as a communication medium using tools such as basic Web pages, wikis, and blogs to improve awareness of planning work in their communities (Steins & Stephens, 2008). In other cases, practitioners have adopted technology in hopes of improving deliberative and collaborative methods using tools including computer games, role-playing or other experiential simulations, and collaborative mapping (Foth, Bajracharya, Brown, & Hearn, 2009). More advanced virtual reality technologies have also been successfully employed to facilitate stakeholder evaluation and deliberation (Gordon & Koo, 2008).

At the same time, technology creates its own barrier to participation from those who are unfamiliar with technology or who lack easy access to computer resources. Even in communities adopting experimental techniques to expand engagement, technology access and computer literacy challenges continue to limit the extent to which technology can facilitate participatory processes (City of Portland, 2007). Relying on Internet-facilitated participatory design, for example, could bias the inclusionary nature of process toward those segments of the population that use the Internet most frequently. For example, Goldfarb and Prince (2008) found that college graduates, people without children, and people whose incomes exceed \$75,000 were most likely to participate in online “e-government” initiatives, in contrast to the intent of many of these initiatives to expand participation in populations who may not have access to or time for participation in more conventional community events.

Although technology can augment and enhance deliberation and discussion in community workshops, it is not a replacement for direct participant interaction (Gordon & Koo, 2008). Practice has shown that successful application of technologies within community participation activities depends heavily on the design of the overall processes and the individual technological aids employed therein (Lobo, 2005). These considerations have often resulted in closed systems oriented toward unidirectional flows of information between planners and participants (Foth et al., 2009).

Dominant design methodologies for popular Internet technologies in recent years, however, have strongly shifted toward the Web 2.0 paradigm, which favors omnidirectional information flow and open systems design (O'Reilly, 2007). The Web 2.0 paradigm emerged in 2005 as a response to early Internet-based applications that were often closed systems, programmatically isolated from one another, and which often focused on a unidirectional "publish-consume" model. Web 2.0 applications, by contrast, attempt to replace "publishing" with "participating" in their application model. The Web 2.0 paradigm places a high importance on collective intelligence, crowd wisdom, and a high level of user-to-user interaction facilitated by flexible application design. More importantly, the Web 2.0 paradigm changes the fundamental role of a user from a mere consumer to a "co-developer" (O'Reilly, 2007, p. 37). The intent of this role shift is to enable users to create collections of content that expand and enrich over time as more users participate (O'Reilly, 2007).

By viewing these growing Web 2.0-fueled content collections as data sets, planners could begin to address questions of epistemology that continue to be raised with traditional planning processes, particularly within an urban context. Foth suggests that Web 2.0 technologies "present diverse possibilities for a profound urban epistemology to evolve" (2009, p. 102), based upon collective intelligence grown

through the analysis of user-generated content. Heretofore, research to investigate this assertion has been limited, but some have noted that the potential benefit from this broader-based epistemological approach will continue to be limited not only by differing socioeconomic patterns of technology use, competency, and access within local communities, (Seeger, 2008) but also by the failure of the profession to recognize technical literacy as a critical professional skill (Guzzetta & Bollens, 2003).

While planners routinely identify communication skills and the ability to understand public needs as their most important professional competencies, they cite technical literacy as one of the least important. Technical literacy is also perceived as much less important for career advancement than other professional skills such as leadership or policy analysis (Guzzetta & Bollens, 2003). Considering the growing use of technology, and more significantly the growing expectation for public processes that are technology-facilitated to some extent, planners must begin to recognize the importance of technical literacy in planning practice, at the risk of creating an increasingly-untenable disconnect between their technical skill and those of the general public.

2.3. Methods and problems related to the programmatic aggregation and analysis of user-generated SNS content

The nature of SNS platforms and the Web 2.0 paradigm itself makes a precise measurement of the total, global amount of user-generated SNS data difficult or even practically impossible, and individual SNS platform operators often guard their own usage and growth data as proprietary. Researchers have attempted to quantify the number of users or patterns of use for individual SNS platforms using a variety of

techniques, but these estimates can be highly variable or unreliable (Rejaie, Torkjazi, Valafar, & Willinger, 2010).

What is known about SNS usage is that it is growing rapidly, in terms of the number of users, the frequency of use, and the sheer volume of user-generated content made publically available. The share of Internet users reporting that they participated in at least one SNS platform rose from 29 percent of users in August 2008 to 47 percent of users in September 2009 (Fox, Zickuhr, & Smith, 2009). More specifically in the case of Twitter, as one example of a specific SNS platform, the company reported that the number of “tweets”, or individual content submissions, grew from 5,000 per day in 2007 to 35 million per day in late 2009. The company anticipates surpassing 50 million tweets per day by the end of 2010 (Twitter, Inc., 2010).

Researchers have found that large amounts of SNS content can be programmatically analyzed to make conclusions about the relationships and characteristics of social networks within specific sub-communities (Jansen, Zhang, Sobel, & Chowdury, 2009), and that this analysis can involve not only the content provided from users, but also to some extent the demographic characteristics of the users themselves (Xu, Liao, Song, & Liu, 2010). Prior research has also shown that SNS content can be used to discern key traits and behaviors of users in the “real” world (Kakihara, 2010).

Broad content analysis of SNS networks, however, often requires significant investments in software and computer capacity and the involvement of highly-specialized experts to process large amounts of textual content to discern individual trends or important topics. The total volume of all SNS content has not been well established, although the rapid expansion in user populations for popular SNS platforms yields some clues as to the vast amount of data that could theoretically be

included for analysis. Provider-enforced limitation on the allocation of computational capacity can restrict access to the entire corpus of content in some cases, although the sheer volume of content can place more practical design limitations on the amount of data which can be feasibly analyzed (Cheong & V. Lee, 2009).

Automated SNS content aggregation and dissemination has sparked concern in some cases over questions of data privacy and propriety. The ability to easily aggregate and manipulate content is one of the hallmarks of the Web 2.0 design paradigm (O'Reilly, 2007); another of these hallmarks, however, is the ability for the user to control the content creation process, a power that some have argued should result in the ability of users to control access to the content that they create, as well as how their content should be used (Boyd, 2008; Fogel & Nehmad, 2009).

In one famous example, Facebook's introduction of their News Feed feature in 2006 dramatically simplified the ability for one user to quickly browse a list of recent content generated by all of their designated friends (who, notably, approved the 'friend' relationship within the Facebook service). The controversy was not necessarily centered around the sudden disclosure of this data within one user's friend network – instead, it was focused on what appeared to users as a sudden and unilateral decision to change the use of this data without the express approval of the users who generated it (Boyd, 2008).

Notwithstanding effects of the “digital divide” discussed earlier, which also manifest themselves in the usage patterns of SNS services, trust and privacy concerns also impact the representativeness of SNS data as compared to the broader population. Analysis of SNS usage has shown some signs of gender-differentiation, for example, as users of SNS platforms tend to be less risk-averse, and men have shown to be less risk-averse than women. Differences also exist between SNS platforms, with

some individual platforms perceived as more “trustworthy” than others (Fogel & Nehmad, 2009). Thus, conclusions made through SNS content analysis require great caution in their application, particularly within broader societal contexts.

Although SNS participation rates have skyrocketed in the general population, and will likely continue to expand in the coming years, the trends and relationships expressed through SNS participation should not be interpreted as being holistically representational of larger social conditions. Instead, these data are indicators which require correlation and analysis within a larger context, in tandem with other information gathered through more traditional means, before supportable findings of social trends or conditions can be defensibly asserted (Reynolds et al., 2010).

2.4. Emerging techniques and challenges involving the application of spatially-referenced SNS content analysis and mobile technologies to solve specific problems.

Recent research has shown that mobile and wireless technologies are being adopted by Internet users at a rapid pace, and that users with mobile or wireless connections are much more likely to utilize SNS platforms. As of September 2009, 54 percent of Internet users connected wirelessly or using mobile devices, and 47 percent of these users participated in at least one SNS, where only eight percent of those not using wireless or mobile technologies participated (Fox et al., 2009).

Internet-enabled mobile devices are increasingly incorporating Global Positioning System technology as a standard feature. By the end of 2011, market research analysts have predicted that nearly 80 percent of new cell phones will come equipped with built-in GPS receivers (Rebello, 2010), and that over half of all new cell phones purchased in the United States will be “smartphones” capable of running

multiple SNS applications optimized for mobile devices (Entner, 2010). Still, the volume of georeferenced content generated through various location-based SNS platforms is quite small when compared to all SNS content overall. As of the end of 2010, just four percent of Americans had used a georeferenced location-based service, and only one percent used a georeferenced service at least weekly (Hill, 2011).

Today, spatially-referenced SNS content is being leveraged to improve awareness and analysis of real-time conditions in some specific contexts. These include the use of mobile devices to analyze local emergency situations (Kwak, Lee, Park, & Moon, 2010; Spellman, 2010), trip generation and travel behavior (Gonzalez et al., 2010), the spread of invasive species impacting agricultural productivity (Rafoss, Sælid, Sletten, Gyland, & Engravslia, 2010), health patterns and epidemic outbreaks, and even tracking of criminals and suspected terrorists (Pentland, 2009).

Some of these applications include the production of mapped SNS content for use by researchers or emergency responders (Longueville, Smith, & Luraschi, 2009). There is some evidence that the use of maps in general to represent participant-contributed data increases the legitimacy of these data from the perspective of planning practitioners. As one of the most commonly used information conduits in the practice, maps appear to be interpreted as more valid and objective instruments on a *prima facie* basis in the profession, and this bias can then be leveraged to improve the legitimacy and value of data which might otherwise be discounted by practitioners (Jackson, 2008).

The open-access nature of SNS platforms introduces a risk to data integrity, as users could theoretically post erroneous or malicious information, which could then be aggregated and disseminated to emergency officials in these cases. The volume of similar SNS content, however, has been used as an inherent data integrity check

against this possibility – when contributions from multiple users in a given area and within a short time span can be correlated, officials tend to view those reports as more authentic (Spellman, 2010).

Similar methods can be employed on much broader scales when augmented through complex automation. In Japan, for example, researchers have built a functional network relying solely on Twitter posts to detect and analyze seismic events in real-time, employing Twitter users as “social sensors”. Thus far, this system of SNS content analysis has matched or exceeded the accuracy of Japanese seismograph networks in nearly 96 percent of mild and major seismic events. As discussed earlier, however, integration of user-contributed data with other information gathered through more traditional means remains an important aspect of effectively responding to these emergency situations (Sakaki, Okazaki, & Matsuo, 2010).

The added element of location within SNS content can amplify concerns about privacy and disclosure discussed earlier. This is particularly true in the case of georeferenced content that, theoretically, could allow the reconstruction of an individual user’s travel over time. Requiring the disclosure of location is often a significant barrier to user participation without some direct or indirect incentive for its use (Sadeh et al., 2008). In response, content providers have introduced user incentives or competitions or have promoted the unique benefits of their location-aware application to attract users. Once users have initially adopted georeferenced applications, however, concerns about privacy and location disclosure tend to diminish (Sadeh et al., 2008).

Georeferencing also introduces additional bias into analysis of broader trends in the general population. Users of georeferenced services are not often representative of the general population: nearly two-thirds are ages 18-43, 70 percent are college graduates, with significantly higher average household incomes. Users also tend to be

overwhelmingly male (Reitsma, 2010). This is consistent with gender-differentiated patterns of SNS usage discussed earlier (Fogel & Nehmad, 2009). Moreover, georeferenced SNS data is perhaps more dramatically skewed due to the additional perceived risk associated with disclosing location.

2.5. Summary

The literature clearly shows a desire by planners to improve the efficacy of conventional community engagement processes, both in terms of the diversity of participants and in the quality of data gathered from contributors. Technology is playing a role, to some extent, in the most recent efforts by planners to improve collaboration and participation, but the use of these technologies has been fairly limited. Moreover, the use of technology can bring with it new challenges and limitations in their application within the context of community engagement.

At the same time, technology has been evolving in favor of a distributed, user-centric content model where users are chiefly responsible for the creation of content, with Web 2.0 applications leveraging multiple platforms to distribute and disseminate content to users. As GPS-enabled smartphones and other location-aware technologies become more widespread, this content is increasingly associated with place, either explicitly through the use of geocoding, or implicitly in the outlines and taxonomies employed to organize user-generated content.

This new location-enabled, context-sensitive capability is beginning to be exploited in other fields to improve their situational awareness and response to current conditions, most notably in the case of emergency management and response. Planners have begun to approach technology as a communication and collaboration

tool, but have yet to exploit the capabilities of location-aware SNS data to their fullest potential. In addition, planners have generally failed to place a significant emphasis on general technology awareness and social media skills as core competencies of effective practitioners going into the future.

3 METHODOLOGY

3.1. Research Questions

This project proposes four primary exploratory research objectives: (i) to examine the extent to which georeferenced SNS data can complement traditional planning data-gathering and research techniques; (ii) to analyze the traits of specific SNS platforms themselves to develop characteristics and indicators that could predict which current and future platforms hold the most promise for application in a planning context; (iii) to explore the practical limitations, implications, and challenges to applying SNS data within planning contexts; and, (iv) to assess the extent to which SNS application can address key shortcomings of traditional surveillance and research techniques commonly used in the practice.

From these objectives, the following set of research questions emerge:

1. What types of data are available from SNS platforms today?
 - a. Which of these data types are most relevant to practitioners?
 - b. Which of these data types are most accessible for application considering technical challenges?
 - c. How can future SNS platforms be evaluated for their potential use in the practice?

2. How can SNS-generated data augment, contradict, or confirm other data gathered through traditional techniques?
 - a. To what extent does the inclusion of SNS data add value to planning deliberations?
 - b. To what extent can SNS analysis address key participatory challenges stemming from current data gathering methods?
 - c. In what contexts are SNS data most likely to positively contribute to planning decisions?
3. What are the most significant barriers to the adoption of SNS analysis as a common means of data gathering in the practice?
 - a. To what extent can SNS data be considered reliable and acceptable for use in planning processes?
 - b. What considerations must be made to address issues of privacy, information ownership, data integrity, and access?

3.2. Methodology

The applicability of SNS content within the realm of planning data gathering and research was examined through the use of comparative multiple case study methodology. Case study research methods focus on comprehensive examination of conditions and phenomena occurring within real-life situations. In contrast to other research methods such as experiments or surveys, case study methodologies enable both widely varying phenomena and the characteristics of their surrounding contexts to be interpreted and evaluated concurrently and comprehensively, often leveraging multiple sources, scopes, and types of evidence (Yin, 2003).

In each case, user-generated SNS data and traditionally-gathered data were collected and compared to discern differences and similarities between datasets. Demographic differences between the participant populations was also examined to the extent possible. Specific criteria were used to evaluate and select potential SNS platforms and individual cases for inclusion in this research project, discussed in additional detail later in this chapter.

Based on the analysis of these cases both individually and collectively, key problems and barriers to the application of SNS-generated data were identified and discussed. These cases also helped to highlight the conditions in which SNS-generated content could hold the most promise for application in future planning processes.

3.3. Operationalization of Terms

To clarify the discussion of the design of this research project and its proposed methods, more detailed definition of specific terminology is necessary. The terms below are used in later sections of this proposal to describe and distinguish various types and collections of data to be utilized in this research project:

- Social Networking System (SNS): A technology service structured to collect and disseminate user-generated content, made available to the general public free of charge (sometimes displaying advertising in lieu of payment for access). These include Web sites such as Facebook, Flickr, Foursquare, LinkedIn, MySpace, Twitter, Yelp , and YouTube, among others.
- Spatially-referenced data: Data which are indexed according to specific locations through the use of georeferencing, programmatic association with explicitly defined

and named places, or both. Examples could include an individual posting on Twitter that includes the location where the posting was made (see the example discussed for georeferenced data below), or a collection of user opinions and reviews submitted to Yelp filed under a heading reflecting the name of a specific location.

- Georeferenced data: Data that include latitude and longitude attributes indicating the location of their generation. Examples could include a photograph posted to Flickr where the user has indicated the specific location of the subject, or an individual posting on Twitter where the user has identified the location where the posting was made. In both cases, the location data is captured as numeric latitude and longitude coordinates.
- SNS platform framework: The organization and taxonomy of spatially-referenced data within a particular SNS, usually organized using georeferencing or the definition of explicit, named places with which data is associated.
- User-generated SNS data: Textual and/or still images contributed by end-users to SNS platforms and publicly displayed to other users.
- Programmatically-derived SNS data: Summary data prepared by SNS platforms through the aggregation or programmatic analysis of user-generated SNS data and/or user demographics.
- Traditionally-gathered data: Qualitative and quantitative data collected through the course of common participatory planning practices, often including user input data collected using community engagement processes, interviews, surveys, or behavioral observation. This data can also include testimony at public hearings, or informal textual or oral input submitted in public workshops.

3.4. SNS platform and data type identification and selection rubric

The wide diversity of SNS platforms in current operation required some limitation in terms of the platforms evaluated in this study. Due to the overwhelming total volume of SNS-generated content, some constraints on research were necessary to ensure that the project could be completed within the anticipated timeframe. Platforms were evaluated and selected based on their ability to meet the research demands of this project, their relative popularity and use patterns in the general public, and the extent to which data within these platforms are made available for analysis.

The following criteria were used to identify specific SNS eligible for examination:

(i) the SNS is structured to partially or entirely classify data within a georeferenced or spatially-associated context; (ii) the SNS is identified as a popular, nationwide platform with a substantial volume of users and participation rates; (iii) the SNS provides the ability to retrieve these data programmatically or through standardized manual processes; (iv) the SNS provides data in textual and/or still image formats; (v) the SNS provides the ability to restrict queries to the English language; and, (vi) the SNS provides the ability to restrict queries to return only data with a specific spatial association to the targeted location. From the set of eligible SNS platforms, multiple platforms were selected to provide a diversity of content types and user populations. Selections were made in a manner that would most likely result in a dataset containing textual user-generated content and still images related to the locations identified.

3.4.1. SNS platform selections

When evaluating SNS platforms for inclusion in this study, it was necessary to exclude some popular platforms due to their poor support for location-awareness and spatially-associated data, or considerable complications accessing the data for

research purposes. Some of the leading SNS platforms currently in use, specifically Facebook, Foursquare, and Twitter, were eliminated from consideration due to these issues. In the case of Facebook, their Places feature requires users to contribute check-ins or reviews to places before being allowed to view other user contributions, and there is no interface to browse all reviewed places within a metropolitan area.

In the case of Foursquare, the application is oriented around reviews of specific businesses, and the collected data is considered proprietary to the Foursquare service and the individual business being reviewed. Attempts to gain access to this data for research purposes were not successful.

In the case of Twitter, historical data was not available through the company's published Application Programmatic Interface (API), and access to the API to retrieve ongoing data was limited by the company due to high server loads. Data that was retrieved had a very low signal-to-noise ratio, making the data that was retrieved often incomplete, difficult to process, and relatively low-value in terms of this study.

In the end, two platforms were selected for use in this study: Flickr and Yelp. These selections allowed the study to proceed in a timely manner and met the requirements for providing both textual and image information related to the case study locations. In addition, these platforms were selected due to their orientation as Web 2.0 applications, and their high level of user accessibility from mobile phones, laptops, and other mobile devices. These services are briefly explained in sections 3.4.2 and 3.4.3.

3.4.2. Flickr

Launched in 2004 by a Canadian startup and subsequently acquired by Yahoo, Inc. in March 2005, Flickr quickly gained popularity as an SNS-oriented photo sharing service due to its innovative tagging, searching, and annotation capabilities. Flickr's

underlying business model supports free access using in-page advertising, allowing users to upload and share a limited number of photos at no charge. Unlimited uploads are available to “pro” users for a modest annual fee. Flickr was designed as a Web 2.0 application from its beginnings, allowing users to share Flickr-hosted photographs in blogs and other online resources (Graham, 2006).

Flickr subsequently added the ability for users to manually georeference images, or automatically use latitude and longitude information stored in image metadata by cameras and phones that are GPS-enabled. As of September 2010, Flickr reported that it had surpassed five billion photos in its catalog, with new content added at the rate of 3,000 images per minute (Sheppard, 2010).

3.4.3. Yelp

Yelp was initially launched in October 2004 as a locally-focused SNS platform offering users the ability to provide textual feedback, ratings, and discussions regarding places in and around San Francisco, California. The service is made available at no charge to users through an advertising-supported business model. Yelp was designed as a Web 2.0-oriented application with an intentional approach intended to eliminate barriers to participation to the maximum extent possible (Orlowski, 2004). As of December 2010, the company reported that the site offered more than 15 million reviews in eight countries worldwide, with more than 39 million unique visitors utilizing the site each month (Stoppelman, 2010).

Notably, Yelp is specifically oriented around place and physical locations. In order for a business or venue to be listed in the Yelp catalog, it must have a physical location – businesses without a bricks-and-mortar locations or community resources without a dedicated and defined location are specifically excluded (Yelp, Inc., n.d.). The

site organizes its content around specific metropolitan areas, with sub-categories pertaining to the type of venue being reviewed (i.e. restaurants, bars, theatres, or parks, to name a few).

Users can nominate new businesses or venues to be reviewed, or add contributions to existing entries. The site offers users the ability to review, check-in, or contribute tips about local venues through GPS-enabled applications for Android smartphones, iPhone, and BlackBerry devices.

3.5. Case identification and selection

Four case studies were examined in the course of this analysis. The following criteria were used to identify specific geographic locations for consideration as a case study, taking into account practical methodological limitations discussed in further detail below: (i) the location is owned by a public governmental agency at the local or regional level; (ii) the location has been the focus of defined planning projects initiated in calendar years 2009 or 2010; (iii) the planning project was coordinated by a public planning agency and utilized observational or participatory data gathering techniques; (iv) findings or in-process data gathered in the course of the project has been made publically available and have been published in English; (v) the location is within the United States; (vi) the total area of the location is 2.0 square miles (5.18 square kilometers) or less; (vii) the physical characteristics of the location allow a specific central point to be defined for use in georeferenced queries; and (viii) spatially-associated data for the location is returned from basic queries made to each of the SNS platforms selected for use in this project.

Public ownership and project coordination (as identified in criteria i and iii above) are critical to the rubric as many of the data to be used could defensibly be considered proprietary to private business enterprises, thus complicating access and requiring permission for use. Sponsorship by a public agency also simplifies access to data as many public agencies are required to provide access planning process data under legal requirements of public disclosure statutes in many jurisdictions in the United States (relating to criterion v above). Public ownership also indirectly frames the scope of these planning processes as concerning the broader city and/or regional community rather than a specific sub-community. This desired city/regional focus necessitates the restriction to local or regional governmental planning processes as identified in criterion ii.

Restricting the study to projects completed in 2009 and 2010 and that utilized observational or participatory data gathering protocols (as identified in criteria ii) was important as this ensured selection of planning projects that occurred during the times when spatially- associated SNS content generation activities accelerated. It was anticipated that this would maximize the possible correlation between what data could have been gathered through SNS analysis with data that was actually collected in practice. Access to these data (as discussed in criterion iv), of course, was a critical prerequisite to this potential correlation, as was the existence of related data in the identified SNS platforms (as identified in criterion viii).

Limiting analysis to relatively confined locations as mentioned in criterion vi helped to ensure that content analysis remains feasible considering the large volume of SNS data that could exist, particularly in regions with high use rates of these technologies. Restricting cases to those with defensibly-identified central points (as identified in criterion vii) ensured that georeferenced queries return data that are most

relevant to the location being examined, without the need to conduct very extensive examination of specific coordinates of data to determine their relevance to the research questions at hand.

The final collection of selected case studies, to the extent feasible, represent varying geographic and demographic conditions, including but not limited to different urban ethnic and socioeconomic conditions, total populations and population densities, land use and development patterns, technology use rates, and anticipated uses and user behaviors in these locations. Preference was given to potential cases where access to data gathered in traditional processes is easier, and where those data reflect higher detail of individual opinions and/or behaviors.

3.5.1. Case study selections

To identify and select cases for this study, an initial search for eligible cases was conducted, utilizing Internet search engines and government Web sites to identify planning projects for consideration. Most of the cases initially identified were found on Web sites of planning agencies at the local level. This initial search yielded 20 case candidates, listed in Table 3-1. Each of these candidates was then evaluated against the criteria detailed in section 3.5 to identify those that would be the best candidates for case study analysis by reviewing the content of the publically-available plan documents, examining the geographical extent of the project area, and performing initial SNS queries to discern the extent of data that could be gathered.

Three plans emerged as the best candidates for further analysis as case studies: the Lyn-Lake Small Area Plan in Minneapolis, Minnesota; the Lexington-East End Small Area Plan in Lexington, Kentucky; and the Cathedral Park Master Plan in Portland, Oregon. After consulting with committee members, the a graduate planning studio

Table 3-1. List of candidate case studies.

Candidate Plan	Location	Year
Arrowood Transit Station Area Plan	Charlotte, NC	2009
Balboa Park Station Area Plan	San Francisco, CA	2009
Cathedral Park Master Plan	Portland, OR	2009
Columbia Point Master Plan	Boston, MA	2009
Downtown Milwaukie Segment (Section of Portland-Milwaukie Light Rail Project)	Milwaukie, OR	2010
Herring Run Park Master Plan	Baltimore, MD	2010
Hyde Park Planning and Rezoning Project	Boston, MA	2010
Lexington Central Sector Small Area Plan	Lexington, KY	2009
Lexington-East End Small Area Plan	Lexington, KY	2009
Lyn-Lake Small Area Plan	Minneapolis, MN	2009
Madison Downtown Plan	Madison, WI	2010
Mission District Streetscape Plan	San Francisco, CA	2010
Near North Area Plan	Milwaukee, WI	2009
Parklane Park Master Plan	Portland, OR	2009
Phillips West Master Land Use Plan	Minneapolis, MN	2009
Pioneer Square (Section of Livable South Downtown Planning Study)	Seattle, WA	2009
Poncey-Highland Neighborhood Master Plan	Atlanta, GA	2009
Transit Center District Plan	San Francisco, CA	2009
Tysons Corner Urban Center Comprehensive Plan	Tysons Corner, VA	2010
Vine City/Washington Park Livable Centers Initiative Study	Atlanta, GA	2009

project in Morro Bay, California, was added as a case to broaden the types of communities under study, as well as to strengthen the connection of this project to sites within California. The context, analysis, and findings from each of these case studies is explained in further detail in Chapter 4.

3.6. Data collection protocol

A common regimen of data collection, normalization, content and data analysis, and evaluation was constructed and implemented across each individual case study to

ensure consistency between cases, allowing for comparison and analysis of case studies in relation to one another. The exploratory nature of this research presents some intrinsic risk to ensuring absolute cross-case consistency of traditionally-gathered data and demographic data, as it is not yet known to what extent the characteristics of these data allow for the development of a consistent, common data schema and scale. The case selection criteria address this risk to some extent. Although the resulting analysis of these data required some flexibility in the analysis regimen for an individual case, collection and data management protocols remained consistent across cases. This limitation does not apply to user-generated SNS data, as these data were gathered using individual sub-collection processes tailored to each selected SNS platform that are globally applicable independent of location.

For each selected case study, data was collected to generate three distinct datasets, to the extent possible: (i) user-generated SNS data related to the location; (ii) demographic information pertaining to users contributing SNS data related to the location; and (iii) community opinion and input gathered by local planning agencies in the course of their prior planning projects. Each dataset is discussed in additional detail below.

To collect user-generated SNS data related to each location, queries were be constructed for each of the SNS platforms identified for use. These queries were constructed to address both georeferenced and non-georeferenced SNS platform frameworks. For georeferenced platforms, a central point was identified as the basis for a radial buffer definition. The latitude and longitude of this point was identified through the use of Google Earth or similar map-based technology. The distance from the central point to the farthest portion of the location was measured to determine the radius to be identified. An error buffer was added to this distance to accommodate potential

fluctuations in coordinate accuracy, based on expected accuracy of GPS technologies and common user behavioral factors. For non-georeferenced frameworks, multiple textual names were identified for each location, reflecting the official name of the location as well as popularly-used alternatives that are identified through internet searches of popular media and other Web-accessible data.

These queries were then be implemented according to the specific searching capabilities of each SNS using systematic manual searches and retrieval processes. Data resulting from queries was be collected in databases, including both textual and image content. These data included the contributed content, date and time of submission, contributing user identifier (either through a unique identifier code or the users' SNS screen name), and geolocation data if applicable. User demographic data was collected as possible through subqueries based upon individually-identified users contributing SNS content. Following collection, user identifiers were retained only as necessary to continue subsequent data collection or to perform content analysis. Agency-collected data was retrieved through publicly-available documents posted on agency Web sites or other document repositories.

3.7. Data analysis

Each collected dataset was examined using content analysis techniques to identify patterns and develop relationships between SNS data and data identified using traditional techniques. Normalization and analysis regimens included checks for data quality and integrity at numerous steps in the process, as well as across cases and SNS platforms.

In each case study, the following data patterns were examined: (i) frequent topics of textual user-generated SNS data; (ii) frequent subjects or components of still image user-generated SNS data; and, (iii) volumes and frequencies patterns of user-generated SNS data. These patterns were then manually evaluated to determine their potential meanings or significance within the context of traditional planning processes. The analysis considered user submissions that occur during the approximate timeframes of the related conventional process implemented in that area.

Following the identification of these patterns, the results of traditional planning data-gathering efforts in each location were be evaluated to determine to what extent they reflect the findings of content analysis of collected SNS data. Where differences are found, they were specifically identified in the findings of each case study.

4 CASE STUDY ANALYSIS AND FINDINGS

Four planning projects were selected as case studies for analysis: the Lyn-Lake Small Area Plan in Minneapolis, Minnesota; the East End-Lexington Small Area Plan in Lexington, Kentucky; the Cathedral Park Master Plan in Portland, Oregon; and the Downtown Morro Bay Enhancement Project (Phase I) in Morro Bay, California, as shown in Figure 4-1. Each of these cases is discussed in further detail in this chapter, with cross-case analysis and findings discussed later in Chapter 5.

Figure 4-1. Overview of case study locations.

4.1. Lyn-Lake Small Area Plan

Lyn-Lake is a neighborhood in southwest Minneapolis, Minnesota, located near the intersection of Lyndale Avenue and 30th Street as shown in Figure 4-2. The City's Midtown Greenway corridor also passes through the neighborhood. Lyn-Lake is characterized as a rapidly-growing area of Minneapolis, with residents that are, on average, younger and less affluent than citywide trends. Development in the Lyn-Lake neighborhood consists primarily of single homes, multi-family residential buildings, and neighborhood-serving commercial establishments.

The Lyn-Lake Small Area Plan was a project of the City of Minneapolis Community Planning and Economic Development Department, ultimately completed and adopted by the Minneapolis City Council on 26 June 2009. The Plan was a subsequent phase of small area planning projects previously completed in surrounding neighborhoods. The purpose of the Plan was to construct a specific implementation framework for broader City land use, transportation, economic, and open space planning goals within the Lyn-Lake neighborhood. The Plan envisions development in the area over a 10 to 15 year timeframe (City of Minneapolis, 2009a).

The City established a Plan steering committee to provide oversight throughout the project, whose members included elected officials and representatives of business, environmental, and social services organizations operating in the neighborhood. Planners conducted community outreach and engagement using a number of methods including open houses and community meetings, surveys, electronic mailings, media releases, and notices and updates published on the project's Web site. A total of four public meetings were held in 2008 and 2009 (City of Minneapolis, 2009a).

Figure 4-2. Map of Lyn-Lake Small Area Plan project area.

In addition to the input received from community members, the City also engaged professional planning and economic consultants to conduct specific analyses of real estate, economic development, urban design, and transportation issues within the plan area. The City published all of this input, including both citizen and consultant recommendations, as an appendix to the finalized plan document (City of Minneapolis, 2009b).

4.1.1. SNS data gathering and initial analysis

A total of 97 pieces of SNS content specifically related to the Lyn-Lake area were identified, including 45 images and 52 textual contributions. Initial analysis of this content yielded 153 instances of specific tags, with “gentrification”, “business”, “art”, “graffiti”, and “mural” most frequent across both sets of content. Image content tagging resulted in 89 tag instances, with “art”, “graffiti”, and “mural” being most frequent, while textual content resulted in 64 tag instances with “gentrification”, “pedestrians”, and “crime” as the most frequent topics. Frequencies for all tags are listed in Table 4-1, and Figures 4-3 through 4-6 show examples of images gathered in the area.

From the initial analysis, these trends were identified as the most frequently occurring within SNS content:

- The perceived threat of gentrification to the neighborhood’s current character;
- Residents’ preference to increase the share of locally-owned businesses within the neighborhood;
- The importance of art venues and events within the neighborhood, including opportunities for both visual and performance arts;
- The prevalence and assumed value of non-sanctioned art such as “graffiti” murals within the neighborhood;

- Pedestrian and bicycle accessibility within the neighborhood; and,
- Negative perceptions of personal safety within the neighborhood, including rates of crime and vandalism.

Table 4-1. Content tag frequencies in SNS data gathered for the Lyn-Lake area.

Tag	Frequency		Total
	In Images	In Text	
apartments	1	0	1
art	13	2	15
bar	2	2	4
bicycles	6	2	8
bowling	1	0	1
business	1	16	17
car	1	0	1
construction	2	0	2
crime	0	2	2
event	5	2	7
flyer	2	0	2
food	3	0	3
gallery	1	0	1
gentrification	0	18	18
graffiti	12	0	12
housing	2	6	8
mixed-use	1	0	1
mural	10	0	10
parking	1	0	1
party	1	0	1
pedestrians	2	6	8
recreation	1	0	1
redevelopment	2	2	4
restaurant	1	0	1
socializing	3	4	7
storefront	3	0	3
street	5	2	7
tagging	2	0	2
vandalism	1	0	1
weather	4	0	4
Total	89	64	153

Figure 4-3. Flickr image showing graffiti art murals in the Lyn Lake neighborhood.

Figure 4-4. Flickr image showing crowds at a local community event.

Figure 4-5. Flickr image showing detail of graffiti art mural.

Figure 4-6. Flickr image showing local bicycle resources in the Lyn Lake neighborhood.

4.1.2. Relationship between SNS-gathered and conventionally-gathered input

Of the themes identified in section 4.1.1, some were also addressed in community input gathered during the planning process using conventional means, while others were omitted entirely, as shown in Table 4-2. Although art culture was discussed in community input, for example, it occurred only within a discussion of “sanctioned” murals but not ad-hoc art that is prevalent within the neighborhood today. Similarly, the artistic culture of the neighborhood was discussed, but not in terms of supporting artistic venues and without discussion of music and other performing arts events.

Likewise, gentrification was only indirectly addressed in terms of maintaining “diversity of ownership” for local residents and businesses, but without the intensity of discussion that occurred within SNS platforms. Housing, although less frequently mentioned online, was missing from local residents’ input, and consultant recommendations did not specifically address concerns related to gentrification and potential changes in housing tenure that could be expected in the wake of neighborhood redevelopment. Vandalism, crime, and perceptions of danger were addressed in both SNS and conventional input, however the issue was more prevalent in conventionally-gathered data compared to the SNS data.

Table 4-2. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Lyn Lake.

Theme	Discussion in conventionally-gathered input
The perceived threat of gentrification to the neighborhood’s current character.	Indirectly, only in terms of preserving “diversity of ownership” for residences in the planning area.
Residents’ preference to increase the share of locally-owned businesses within the neighborhood.	Indirectly, only in terms of preserving “diversity of ownership” for businesses in the planning area.
The importance of art venues and events within the neighborhood, including opportunities for both visual and performance arts.	Yes, in terms of preserving and expanding arts venues in the neighborhood.
The prevalence and assumed value of non-sanctioned art such as “graffiti” murals within the neighborhood.	None, although “sanctioned” murals are mentioned briefly.
Pedestrian and bicycle accessibility within the neighborhood.	Yes, in terms of promoting walkability and improving connections to citywide bicycle infrastructure.
Negative perceptions of personal safety within the neighborhood, including rates of crime and vandalism.	Yes, in terms of increasing police presence and community efforts to reduce crime.

4.1.3. Reflections of community input in the Plan document

Themes addressed in SNS data were also inconsistently reflected in the language of the final Plan document, as indicated in Table 4-3. Most notably, the plan document does not discuss potential negative consequences of gentrification whatsoever, and only addresses the importance of maintaining local business ownership in terms of mentioning loan programs intended to help small business owners.

Another notable exclusion is the role of both sanctioned and ad-hoc artistic venues within the neighborhood, which is entirely missing from the Plan document. Likewise, the Plan only indirectly discusses methods to improve perceptions of personal safety or reduce crime, instead focusing on efforts to activate vacant lots as a

Table 4-3. Extent to which themes identified in SNS data were discussed in final language in the Lyn-Lake Small Area Plan.

Theme	Discussion in final plan language
The perceived threat of gentrification to the neighborhood's current character.	None.
Residents' preference to increase the share of locally-owned businesses within the neighborhood.	Indirectly, only by mention of small-business loan assistance programs.
The importance of art venues and events within the neighborhood, including opportunities for both visual and performance arts.	None.
The prevalence and assumed value of non-sanctioned art such as "graffiti" murals within the neighborhood.	None.
Pedestrian and bicycle accessibility within the neighborhood.	Yes, discussed extensively in accordance with citywide pedestrian and bicycle network planning.
Negative perceptions of personal safety within the neighborhood, including rates of crime and vandalism.	Indirectly, only in terms of activating vacant lots to improve effects of "eyes on the street".

means of improving “eyes on the street”. The Plan document did, however, address issues of pedestrian and bicycle accessibility in extensive detail, particularly in terms of improving the integration of the Midtown Greenway within the core commercial area of the neighborhood.

4.2. East End-Lexington Small Area Plan

The East End neighborhood in Lexington, Kentucky, is a 387-acre area situated between the Central Business District to the west and an established industrial area to the east. Historically, the neighborhood was a prominent center of Lexington’s African-American community, but patterns of suburbanization and changing neighborhood conditions resulted in significant residential and commercial outmigration beginning in the mid-1960s. Currently, approximately 3,940 residents live in the neighborhood (Lexington-Fayette Urban County Government [LFUCG], 2009). A detail map of the neighborhood is shown in Figure 4-7.

Development in the neighborhood is dominated by single and multi-family housing with some commercial activity at the edges of the planning area. The neighborhood also includes Thoroughbred Park and a large area of redevelopment land at the center of the neighborhood, containing an elementary school and new housing development.

The East End-Lexington Small Area Plan project was initiated by the Lexington-Fayette Urban County Government (LFUCG) as a means of revitalizing and redeveloping the neighborhood. The final Plan, which was formally adopted in 2009, was a collaborative effort involving LFUCG, local community organizations, and locally-based planning consultancy firms. The plan enunciates an overall community vision,

Figure 4-7. Map of Lexington-East End Small Area Plan project area.

specific goals and objectives, and implementation targets over the next 10 to 20 years (LFUCG, 2009).

A formal steering committee was established to guide the Plan development process, consisting of elected officials, planning commission representatives, local residents, business owners in the area, and leadership of area religious institutions. Planners conducted community outreach using a variety of methods, including open houses, community meetings, print and broadcast media, and a Web site containing textual and video content. In these events, planners focused on the use of active listening and community visioning activities to elicit community input, providing Spanish language translation where necessary to lower barriers to participation. A total of three public meetings were held in late 2008, including a meeting to receive feedback on draft goals based on prior community input (LFUCG, 2009). The adopted Plan document includes a consolidated description of outcomes of these sessions.

4.2.1. SNS data gathering and initial analysis

Searches for SNS data related to East End-Lexington yielded 26 items, including 24 photographs and two text items. Initial analysis of these data resulted in 51 tag instances, as detailed in Table 4-4. Tags with the highest frequencies were “event”, “parade”, “park”, “art”, and “sculpture”. Differentiation of tag frequencies between text and image content is not significant in this case due to the extremely small sample of text content obtained in SNS searches. Figures 4-8 through 4-11 show examples of images downloaded pertaining to the area.

Table 4-4. Content tag frequencies in SNS data gathered for the Lexington-East End area.

Tag	Frequency		Total
	In Images	In Text	
ambulance	1	0	1
art	4	0	4
beauty	0	1	1
buildings	1	0	1
car	2	0	2
cemetery	1	0	1
children	0	1	1
dogs	1	0	1
event	6	0	6
firetruck	2	0	2
fountain	1	0	1
gallery	1	0	1
graffiti	1	0	1
music	1	0	1
parade	4	0	4
park	4	0	4
pedestrians	0	1	1
picnicking	0	1	1
playground	0	1	1
recreation	0	2	2
sculpture	3	0	3
socializing	2	0	2
statue	3	0	3
street	2	0	2
streetfront	1	0	1
theater	1	0	1
train	1	0	1
weather	1	0	1
Total	44	7	51

Figure 4-8. Example of art in Thoroughbred Park.

Figure 4-9. Example of sculptures in Thoroughbred Park.

Figure 4-10. Flickr image showing built environment adjacent to the study area.

Figure 4-11. Flickr image of cemetery markers within the study area.

Analysis of this case is also complicated by the limited topical scope of the data obtained in SNS searches. This narrow scope results in fewer identified themes in SNS data. These themes were identified:

- The significance of community events occurring within the neighborhood;
- The importance of park resources as centers of activity within the neighborhood; and,
- The important role of sculptures and public art installations within Thoroughbred Park.

4.2.2. Relationship between SNS-gathered and conventionally-gathered input

As shown in Table 4-5, two of the three themes identified in section 4.2.1 were identified to some degree by community members contributing input to planners. Community members clearly expressed a desire to expand public art installations within the neighborhood – indeed, completion of a Memorial Art Garden within Thoroughbred Park was explicitly listed as one of ten top neighborhood planning priorities. The role of park areas as centers of community activity, however, was only indirectly discussed in

Table 4-5. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Lexington-East End.

Theme	Discussion in conventionally-gathered input
The significance of community events occurring within the neighborhood.	None.
The importance of park resources as centers of activity within the neighborhood.	Indirectly, in terms of a desire for park areas to be developed in conjunction with neighborhood beautification programs.
The important role of sculptures and public art installations within Thoroughbred Park.	Yes, including explicit inclusion of an art garden as a top neighborhood planning priority.

Table 4-6. Extent to which themes identified in SNS data were discussed in final language in the Lexington-East End Small Area Plan.

Theme	Discussion in final plan language
The significance of community events occurring within the neighborhood.	Yes, explicitly identified as actions under multiple plan objectives.
The importance of park resources as centers of activity within the neighborhood.	Yes, explicitly, in terms of expanding current facilities, adding new parks and recreation facilities, and utilizing parks as gateways to the neighborhood.
The important role of sculptures and public art installations within Thoroughbred Park.	Yes, specifically the near-term completion of the Memorial Art Garden.

terms of neighborhood beautification efforts that could include the addition of parks and open space as the neighborhood continues its redevelopment. The significance of community events within the neighborhood was not included whatsoever in the community input.

4.2.3. Reflections of community input in the Plan document

All of the themes identified in section 4.2.1 were included in the implementation objectives and actions in the Plan document, as shown in Table 4-6. The role of public

park space was most prevalent in plan goals, objectives, and actions, in goals related to civic investment, walkability, streetscape improvement, urban design and land use compatibility, personal health, community organizations, and green infrastructure.

Public art actions were identified in a number of goal areas concerning community cultural heritage preservation, civic investment, streetscape improvement, urban design, and community organization engagement. Community events were mentioned as implementation actions for a number of objectives to achieve goals in the area of community cultural heritage and personal health.

4.3. Cathedral Park Master Plan (Portland, Oregon)

Cathedral Park is a 23-acre public park in Portland, Oregon, located in the City's St. Johns neighborhood, adjacent to the iconic St. Johns Bridge on the banks of the Willamette River, as shown in Figure 4-12. The Park holds a number of public events popular with residents throughout the City, but its primary function is to serve as a recreational and open space resource for nearby residents. Currently, amenities in the Park include lawns and open space, pedestrian and bicycle paths, river docks, gardens, picnicking facilities, and an amphitheatre. No children's playground is currently available within the Park.

The Park's profile within the neighborhood is expected to rise as a result of new higher-density residential development adjacent to the Park, as well as new greenway recreational opportunities connecting Cathedral Park with other open space assets along the Willamette River. The Cathedral Park Master Plan is intended to provide a framework for Park improvement and maintenance over the next 25 years. Completed in 1980, the Park is relatively new compared to others in the City of Portland, but

Figure 4-12. Map of Cathedral Park Master Plan project area.

facilities, amenities, and programming will likely require upgrades to continue to serve both existing and new users, particularly children and the elderly. In addition, due to its proximity to the Willamette River, additional development within the Park will need to be carefully planned in order to minimize negative environmental impacts and meet state mandates for development in sensitive natural areas.

To oversee the plan development process, the City convened two oversight committees: a Technical Advisory Committee (TAC), consisting primarily of government officials (at the state, regional, and local levels), representatives of organizations backing established events in the Park, and City planning staff; and a Public Advisory Committee (PAC), consisting of local residents including those within the St. Johns neighborhood and citizens from other areas of the City. The PAC included nine community members; the number of committee members on the TAC is not known.

Community outreach related to the planning project included four PAC meetings and two community open houses held during spring and summer 2008. At each of these events, a number of community engagement methods were employed, including open discussion, collection of written feedback, direct commentary on proposals, and individual attendee interviews. These events were publicized through local media, flyers mailed to local residences, and on the Portland Parks and Recreation Bureau Web site. In addition to these meetings, a final public hearing was held where the draft plan was formally presented for public comment. Public input from these events was compiled and included within the Plan document; specific proceedings of TAC meetings, however, were not separately included.

4.3.1. SNS data gathering and initial analysis

Searches for SNS data related to Cathedral Park yielded 120 items, including 66 photographs and 54 text items. Initial analysis of these data resulted in 286 tag instances, as detailed in Table 4-7. Tags with the highest frequencies were “bridge”, “walking”, “socializing”, “dogs”, and “music”. Image content tagging resulted in 127 tag instances, with “bridge”, “socializing”, and “event” being most frequent, while textual content resulted in 159 tag instances with “walking”, “bridge”, and “views” as the most frequent topics. Frequencies for all tags are listed in Table 4-7, and Figures 4-13 through 4-16 show examples of images gathered in the area.

From the initial analysis, these trends were identified as the most frequently occurring within SNS content:

- The importance of the bridge as an iconic image anchoring the park’s identity;
- The role of the park in providing essential walking, bicycling, and recreation assets for the neighborhood;
- The high frequency of socializing that occurs within the park, particularly as a resource for dog play and exercise;
- The importance of the park as an event venue, especially for music-related events; and,
- The importance of access to the river and dock facilities as a key amenity within the park.

Table 4-7. Content tag frequencies in SNS data gathered for the Cathedral Park area.

Tag	Frequency		Total
	In Images	In Text	
accessibility	0	7	7
art	3	0	3
beach	7	0	7
bicycles	5	2	7
boats	2	12	14
bridge	15	19	34
children	3	2	5
crime	0	8	8
disinvestment	0	1	1
docks	4	0	4
dogs	9	11	20
event	10	8	19
haunted	0	6	6
history	1	0	1
lawn	11	0	11
music	11	12	23
nature	4	6	10
noise	0	3	3
paths	11	0	11
picnicking	2	4	6
quiet	0	6	6
romance	4	0	4
socializing	13	8	21
terrain	0	6	6
trees	4	0	4
views	0	16	16
walking	3	22	25
weather	1	0	1
wildlife	3	0	3
Total	127	159	286

Figure 4-13. Flickr image showing adults and children attending a musical event in Cathedral Park.

Figure 4-14. Flickr image of park users socializing.

Figure 4-15. Flickr image showing the St. Johns Bridge and adjacent bicycle trails.

Figure 4-16. Flickr image of attendees of the Portland Pirate Festival, an annual event in Cathedral Park.

4.3.2. Relationship between SNS-gathered and conventionally-gathered input

Most of the main themes identified in SNS data were addressed in the conventional engagement processes, as shown in Table 4-8, with two significant exceptions concerning dog-related amenities and the extent to which the park could be improved to better support existing events.

There was no discussion in conventional input discussing new resources for dogs in the Park, other than addressing cases where users had dogs off-leash in areas not designated for off-leash play, in violation of Park regulations. Community input regarding dogs was oriented sharply toward enforcement of current regulations rather

Table 4-8. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Cathedral Park.

Theme	Discussion in conventionally-gathered input
The importance of the bridge as an iconic image anchoring the park's identity.	Yes, both in terms of its physical dominance in the Park as well as its historical connection.
The role of the park in providing essential walking, bicycling, and recreation assets for the neighborhood.	Yes, both locally and as part of the citywide network.
The high frequency of socializing that occurs within the park, particularly as a resource for dog play and exercise.	Indirectly in terms of new child play areas, but not addressing dog play and exercise whatsoever.
The importance of the park as an event venue, especially for music-related events.	To a limited extent, but not addressing music-related events and failing to evaluate how the park could better serve the existing set of events.
The importance of access to the river and dock facilities as a key amenity within the park.	Yes, both in terms of public dock and beach access.

than the creation of new amenities or the relocation of existing amenities. SNS data analysis indicates, however, that dogs are a significant player in the park, a topic that was not reflected in conventional input.

Community input concerning events was limited to ensuring that events were appropriately sized for the neighborhood, and that resources such as park restrooms were refurbished. There was no discussion of the nature of some of these events, or improvements that could be made to better support existing events, specifically music-related events that are quite popular. SNS data, on the other hand, show that these events are quite dominant in terms of users' perceptions of the park itself.

4.3.3. Reflections of community input in the Plan document

In the case of Cathedral Park, the final Plan language appears to more completely address the topics found in both conventional community input and SNS data. For example, the Plan language specifically addresses current and future music-related events with an extensive section of the Plan devoted to its role as a public event venue. The Plan cites specific festivals that have been popular events in the Park, including the Cathedral Park Jazz Festival and the Pirate Festival (City of Portland, 2009, p. 26). The Plan also identifies specific improvements related to the venue's suitability as a musical performance venue.

The role of dogs in the park was discussed only in terms of relocating the existing off-leash area in an effort to reduce park regulation violations from off-leash users in other areas of the park. No other mention of dogs or dog-related uses

Table 4-9. Extent to which themes identified in SNS data were discussed in final language of the Cathedral Park Master Plan.

Theme	Discussion in final plan language
The importance of the bridge as an iconic image anchoring the park's identity.	Yes, extensively.
The role of the park in providing essential walking, bicycling, and recreation assets for the neighborhood.	Yes, with a specific access and circulation section that addresses walking and bicycling in terms of recreation as well as part of the citywide circulation infrastructure.
The high frequency of socializing that occurs within the park, particularly as a resource for dog play and exercise.	Very limited in terms of socializing areas. Dog discussion limited to relocation of existing off-leash area.
The importance of the park as an event venue, especially for music-related events.	Yes, with a specific public event venue section.
The importance of access to the river and dock facilities as a key amenity within the park.	Yes, extensively, in terms of refurbishing riverfront infrastructure and creating new pedestrian/bicycle connections to the docks and public beach.

appeared in the document, although the Plan does discuss the use of the Park for informal recreation and quiet reflection, which were both identified within SNS data analysis but not specifically discussed in conventional data gathering.

4.4. Downtown Morro Bay (California) Enhancement Project (Phase I)

Morro Bay, California, is a coastal community located in San Luis Obispo County, California, situated along California Route 1 approximately halfway between the San Francisco Bay Area and the Los Angeles Metropolitan Area. Due to its location along the coastline, tourism is a dominant component of the local economy.

The Downtown area consists of 18 blocks in the City's central region, immediately adjacent to its main tourist area, the Embarcadero. Activity in the Downtown area is noticeably lower than in the adjacent areas, which prompted City officials to explore work to update the City's Downtown Specific Plan. The first phase of this effort, the Downtown Morro Bay Enhancement Project (Phase I), was launched in 2010 by City officials working in conjunction with the City and Regional Planning Department at California Polytechnic State University, San Luis Obispo. The project study area is shown in Figure 4-17.

In Spring 2010, graduate students from the Department conducted an initial study of the Downtown area, resulting in three development alternatives presented to the City for use in subsequent work. These alternatives were accepted by the City in June 2010, but further development of a specific plan for Downtown has not proceeded. Although this plan was not formally adopted, it remains a useful case for study here as it included extensive community outreach efforts, which served as the partial basis for recommendations in each of the alternatives. Outreach efforts included

Figure 4-17. Map of Downtown Morro Bay Enhancement Project area.

attendance at various community meetings and events, publicity via local media and the project's Web site, two community workshop meetings, and a formal public presentation of the alternatives at a Planning Commission meeting. Techniques utilized in these engagements included Wish poem exercises, a PARK (Preserve/Add/Remove/Keep Out) brainstorming exercise, an awareness walk and camera survey with local residents, and conceptual diagramming exercises.

The process of gathering, analyzing, and describing community input in the Morro Bay case differs from the other three cases studied, as the Morro Bay process was explicitly designed to produce three development alternatives for further consideration and action by the City. The overall project utilized community meetings and engagement techniques common to all three alternatives, but each alternative group independently analyzed and applied the data gathered from the common events.

4.4.1. SNS data gathering and initial analysis

Searches for SNS data related to Downtown Morro Bay yielded 37 items, including 29 images and eight text items. Initial analysis of these data resulted in 51 tag instances, as detailed in Table 4-10. Tags with the highest frequencies were “event”, “rock”, “dogs”, “accessibility”, “music”, and “views”. Due to the small sample of text content obtained from SNS data gathering, differentiation of tag frequencies between text and image content is not significant in this case. Figures 4-18 through 4-21 show examples of images downloaded from SNS services related to the project area.

From the initial analysis, these trends were identified as the most frequently occurring within SNS content:

- The importance of the downtown area as a significant events venue;

- The centrality of the downtown area compared to attractions such as the Embarcadero, Morro Rock, and Highway 1; and,
- The importance of viewshed connections to Morro Rock in defining Downtown identity.

Table 4-10. Content tag frequencies in SNS data gathered for Downtown Morro Bay.

Tag	Frequency		Total
	In Images	In Text	
accessibility	0	3	3
art	1	0	1
business	1	1	2
children	2	0	2
dogs	4	0	4
event	14	4	18
market	2	0	2
mural	1	0	1
music	3	0	3
nature	1	0	1
parade	1	0	1
rock	2	3	5
skateboarding	2	0	2
socializing	1	0	1
views	3	0	3
walking	2	0	2
Total	40	11	51

Figure 4-18. Driver in annual classic car event in Downtown Morro Bay.

Figure 4-19. Sunset view of Morro Rock from Downtown Morro Bay.

Figure 4-20. Skateboarder event participant in Downtown Morro Bay.

Figure 4-21. Men cleaning fish at the weekly Farmers' Market in Downtown Morro Bay.

4.4.2. Relationship between SNS-gathered and conventionally-gathered input

The themes identified in section 4.4.1 were most aligned with community-gathered input in terms of extending the use of the downtown area as an events venue, particularly for music-related events, as shown in Table 4-11. This was most notable in the results of the Wish Poem and PARK exercises, where residents were eager to see event-related amenities added, such as dedicated performance space, public plazas, car-free areas, and public restrooms. The Farmer's Market was one of the most frequently identified items to preserve, as were current arts venues such as the historic Bay Theatre, and a car-free public plaza was highly ranked in the Wish Poem exercise.

Table 4-11. Extent to which themes identified in SNS data were discussed in conventional data-gathering in Downtown Morro Bay.

Theme	Discussion in conventionally-gathered input
The importance of the downtown area as a significant events venue.	Yes, with specific mention of venues and amenities that would support these events.
The centrality of the downtown area compared to attractions such as the Embarcadero, Morro Rock, and Highway 1.	To a limited extent, and then primarily concerned with serving local resident needs rather than tourism.
The importance of viewshed connections to Morro Rock in defining the downtown identity.	Not specifically.

Although residents alluded to the centrality of the Downtown area and its potential connections to Highway 1 and the Embarcadero area, participants expressed a desire to leverage these connections to serve local residents rather than extending amenities to attract additional tourists. This was significantly different from the sentiments related to centrality addressed in SNS data, which tended to mention Downtown as an attraction that complements nearby tourist areas. In addition, participants did not express a desire for improved connections to Highway 1 or other road infrastructure, and in fact preferred to emphasize alternative modes such as bicycling and walking in the Downtown area.

Most notably, no resident expressed a strong preference for development that reinforced viewshed connections with Morro Rock. In fact, views were only lightly mentioned in either the PARK or Wish Poem exercise, and there were no trends that suggested that participants in the camera visual preference exercise took photographs that leveraged Morro Rock as a defining characteristic. One reason for this could be the dominant nature of the rock in Morro Bay's current cityscape, leading to participants perhaps taking the viewshed for granted. At the subsequent Planning Commission

Table 4-12. Extent to which themes identified in SNS data were discussed in final language in Downtown Morro Bay plan alternatives.

Theme	Discussion in final plan language
The importance of the downtown area as a significant events venue.	<p><u>Alternative A:</u> Yes, including creation of a dedicated plaza and events area.</p> <p><u>Alternative B:</u> Yes, in terms of visual arts venues and public plazas that can be used for events.</p> <p><u>Alternative C:</u> Yes, including specific land use designations for performing and visual arts venues, and festival street designs to support community events.</p>
The centrality of the downtown area compared to attractions such as the Embarcadero, Morro Rock, and Highway 1.	<p><u>Alternative A:</u> None.</p> <p><u>Alternative B:</u> Yes, in terms of improving pedestrian connections to the Embarcadero.</p> <p><u>Alternative C:</u> Only briefly discussed as a design goal of circulation improvements.</p>
The importance of viewshed connections to Morro Rock in defining the downtown identity.	<p><u>Alternatives A and B:</u> Some discussion of preserving viewsheds in design regulations.</p> <p><u>Alternative C:</u> Discussed only as a visual design characteristic related to the proposed arts and entertainment center.</p>

hearing, for example, commissioners did question the extent to which views could be blocked by development proposed in some alternatives, although these concerns did not appear in the citizen input phases of the plan development process.

4.4.3. Reflections of community input in the Plan document

Each of the plan alternatives developed by the student teams addressed the topics identified in section 4.4.1 differently; table 4-12 identifies how each alternative approached these topics. Each alternative recognized the importance of events, particularly art-related events, in the Downtown area, proposing a number of improvements including additional permanent or temporary pedestrian plazas, visual

and performing arts venues, parks, public restrooms, and other infrastructure related to community events.

The other two topics identified in section 4.4.1 were only lightly addressed in the plan alternatives. None of the alternatives suggested extensive circulation improvements to strengthen automobile access from Highway 1 or surrounding neighborhoods, although each did suggest improving pedestrian and bicycle connections with the Embarcadero. Likewise, the importance of viewsheds was only briefly reflected in the plan alternative, most often as a design regulation intended to limit building heights in the downtown area. One alternative suggested using the Morro Rock viewshed as a design feature of a proposed amphitheatre.

4.5. Summary

Each of the four case study areas allowed the applicability of SNS data to be explored within planning projects of various sizes, scopes, and within a wide range of community contexts. The results of the individual case evaluations allow for some broader trends to be identified and explored that further explain the potential for SNS data to improve conventional data gathering efforts. These cross-case findings are identified and discussed in Chapter 5, with resulting conclusions and implications from both individual and cross-case findings presented thereafter.

5 CROSS-CASE ANALYSIS AND FINDINGS

A number of key findings emerge from cross-case comparison. For example, there appeared to be no relationship between the volume of data collected and the total size of the project area under study, but there is a likely relationship between the total volume of data collected and the characteristics and underlying identity definition of a project area. In addition, textual SNS data analysis was more likely than image SNS data to discuss negative aspects of the respective study areas, and textual data was more likely to address a wider range of topical issues compared to image data. Finally, SNS data does appear to offer additional clues and detail about activities within places that may otherwise be assumed by planners, and could reinforce topics and themes that are identified in conventional participatory processes, but are ultimately excluded from final plan language. Each of these themes is discussed in further detail in this Chapter.

5.1. Overall SNS data volume and tag instances

In total, SNS data queries yielded 280 data points across the four case studies, consisting of 164 images and 116 pieces of textual content, as detailed in Table 5-1. Content analysis of these data resulted in 541 tag instances throughout the four case

studies, using a taxonomy of 70 unique terms. These terms and their frequency of occurrence are shown in Table 5-2.

Table 5-1. Total volume of image and text data found in SNS searches across all four case studies.

Case Study	Images	Text	Total
Lyn Lake	45	52	97
East End	24	2	26
Cathedral Park	66	54	120
Downtown Morro Bay	29	8	37
Total	164	116	280

Table 5-2. Frequency of tags across all data and all case studies.

Tag	Lyn-Lake		East End		Cathedral Park		Morro Bay		Total	
	Image	Text	Image	Text	Image	Text	Image	Text	Image	Text
accessibility						7		3	0	10
ambulance			1						1	0
apartments	1								1	0
art	13	2	3		3		1		20	2
bar	2	2							2	2
beach					7				7	0
beauty				1					0	1
bicycles	6	2			5	2			11	4
boats					2	12			2	12
bowling	1								1	0
bridge					15	19			15	19
buildings			1						1	0
business	1	16					1	1	2	17
car	1		2						3	0
cemetery			1						1	0
children				1	3	2	2		5	3
construction	2								2	0
crime		2				8			0	10
disinvestment						1			0	1
docks					4				4	0
dogs			1		9	11	4		14	11
event	5	2	6		15	8	14	4	40	14
fire truck			2						2	0
flyer	2								2	0
food	3								3	0
fountain			1						1	0
gallery	1		1						2	0
gentrification		18							0	18
graffiti	12		1						13	0
haunted						6			0	6

Tag	Lyn-Lake		East End		Cathedral Park		Morro Bay		Total	
	Image	Text	Image	Text	Image	Text	Image	Text	Image	Text
history					1				1	0
housing	2	6							2	6
lawn					11				11	0
market							2		2	0
mixed-use	1								1	0
mural	10						1		11	0
music			1		7	12	3		11	12
nature					4	6	1		5	6
noise						3			0	3
parade			4				1		5	0
park			4						4	0
parking	1								1	0
party	1								1	0
paths					11				11	0
pedestrians	2	6		1					2	7
picnicking				1	2	4			2	5
playground				1					0	1
quiet						6			0	6
recreation	1			2					1	2
redevelopment	2	2							2	2
restaurant	1								1	0
rock							2	3	2	3
romance									4	0
sculpture			3			4			3	0
skateboarding							2		2	0
socializing	3	4	2		13	8	1		19	12
statue			4						4	0
storefront	3								3	0
street	5	2	2						7	2
streetfront			1						1	0

Tag	Lyn-Lake		East End		Cathedral Park		Morro Bay		Total	
	Image	Text	Image	Text	Image	Text	Image	Text	Image	Text
tagging	2								2	0
terrain						6			0	6
theater			1						1	0
train			1						1	0
trees					4				4	0
vandalism	1								1	0
views						16	3		3	16
walking					3	22	2		5	22
weather	4		1		1				6	0
wildlife					3				3	0
Total	89	64	44	7	127	159	40	11	300	241

5.2. Volume of SNS data not necessarily related to the geographic size of the project area.

Figure 5-1 illustrates the different geographic sizes of cases included in the study. Despite these different project area sizes, no relationship was apparent between the size of a project area and the volume of retrieved SNS data, as shown in Table 5-3.

Although the physically-largest case study area (East End) received the lowest number of data points per acre, and the smallest case study area (Cathedral Park) received the highest, no consistent relationship between geographic size and data density can be established. Instead, other characteristics are likely responsible for varying volumes of SNS data, discussed later in this Chapter.

Table 5-3. Comparison of project area geographic size and number of data points per acre.

Case Study	Project Area (acres)	Data Points	Data Points/ acre
Lyn Lake	60.1	97	1.61
East End	384.2	26	0.07
Cathedral Park	22.2	120	5.41
Downtown Morro Bay	47.0	37	0.79

5.3. Textual SNS tends to discuss multiple topics.

Most SNS data collected received multiple tags during the content analysis process; textual SNS data, however, tended to discuss a higher number of topics than image content. As shown in Table 5-4, textual data received an average of 2.08 tags per data point, where image data received an average of 1.83 tags per data point. Although this is a relatively small difference, it highlights a significant difference

Table 5-4. Average number of tags per data point by data type.

SNS Data Type	Data Points	Tag Instances	Tag Instances/ Data Point
Image	164	300	1.83
Text	116	241	2.08
Total	280	541	1.93

between text and image content. Whereas the content of images is limited to the frame of the photograph, most textual SNS data is much more open-ended, and multiple topics are more easily covered in a single textual content item.

This dichotomy also illustrates the fundamental difference in interpretation of image and textual SNS content. The intended subject matter of the photographer, although clearly evident in many photographs, is in all cases inferred through interpretation of the photograph itself. Discerning meaning can be much less inferential with textual content, where the specific language crafted by the author conveys the intent and message. Still, both types of SNS are subject to a significant amount of interpretation by the viewer, and this finding is a reminder of the importance of applying a standardized rubric or taxonomy when attempting to perform systematic analysis of SNS content.

5.4. Textual SNS more likely to reveal challenges or negative feedback.

Topics that were negative or contained constructive feedback were more likely to be communicated using textual content, rather than in images. Across all cases, textual tag instances occurred at a rate of approximately 0.8 per image tag instance.

When considering tags related to negative or critical topics, however, textual tag instances occurred at a rate of 2.1 per image tag instance, as shown in Table 5-5.

Table 5-5. Tag frequencies for negative topics across all cases.

Tag	Tag Instances	
	Image	Text
crime	0	10
disinvestment	0	1
gentrification	0	18
graffiti	13	0
noise	0	3
redevelopment	2	2
vandalism	1	0
Total	16	34

Part of this phenomenon could be explained by the underlying rationale of people to use digital photography and social network photo sharing services. Prior research has found that online photographers are largely motivated by storytelling and artistic display rather than systematic journaling of an experience in a particular place. Users of online photo sharing services (such as Flickr, employed in this study) are more likely to take and share photos that they find memorable, demonstrate relationships with other people or places, and are self-expressive (Van House et al., 2004). Negative experiences in a place, therefore, may be perceived by participants as less worthy of photo documentation.

The fundamental differences between textual and image content discussed in section 5.3 are also likely related to this phenomenon. In a photograph, it is difficult to offer nuanced or constructive criticism, or present two sides of an observation to provide balance. Both of these approaches are quite simple with textual content, and

are often employed in providing both the positive and negative points of a particular location in user reviews.

5.5. Demographic analysis was not possible due to limited data available

Although this study attempted to examine the demographics of users contributing SNS content in the four case study areas, it quickly became apparent that such analysis was not possible due to limitations in data available from SNS platform providers. On SNS platforms, demographic information is generally stored as part of the user profile feature. SNS platforms can choose to require certain data to be submitted by users when signing up for the service. Some SNS platforms shield this information from the public, or give users the ability to restrict public availability of their data.

Neither Yelp nor Flickr require users to submit demographic information as part of the account creation process, and neither offer users the ability to input certain basic demographic information such as age. Other demographic information such as sex or location are entirely optional, and only sporadically completed by users. Thus, attempting demographic analysis of users in each of the cases is not possible.

5.6. Volume of SNS data appears to be related to the imageability and defined identity of project areas.

Based on the data collected in each of the case studies, there appears to be a relationship between the volume of SNS data collected and the level at which an area can be easily defined and recognized by the general public. Each of the four case study areas differed in the extent that they were readily identified with a commonly-recognized name and imageable in terms of the classic city elements first explained by

Lynch (1960). These differences appear to be related to different volumes of SNS data found in each case study, with Cathedral Park and Lyn Lake being the two more imageable cases from a Lynchian perspective, and at the same time, having higher SNS data volumes than the other two, less-imageable case study areas.

As shown in Table 5-1, data volumes were highest for the Cathedral Park case study area. Public parks are perhaps one of the most easily-identifiable types of public space in cities; in the case of Cathedral Park, its paths, edges, and nodes are clearly evident to users, and the St. Johns Bridge serves as a dramatic landmark within the park boundaries. The park is clearly named, and the numerous public events that occur within the park raise its awareness in the surrounding community.

The Lyn Lake case study area had the second-highest data volume, as shown in Table 5-1. Although its edges are less defined than those in Cathedral Park, the area is situated along two dominant paths (Lyndale Avenue and 30th Street), contains a easily defined node at the intersection of the two main streets, and to a lesser extent, the intersection of Lyndale Avenue with the Midtown Greenway. The area is also popularly known as “Lyn Lake” to area residents, as demonstrated in some of the retrieved SNS data.

Both of the cases with lower SNS volumes suffered from poor imageability and public awareness. Although both had clearly-defined boundaries from an administrative standpoint, these were less obvious when viewed against Lynch’s rubric, and neither were widely identified as districts or distinct areas with their own identity. In the case of Morro Bay, the downtown area is not well defined as an area separate from the Embarcadero or other adjacent neighborhoods. East End, on the other hand, lacks attractions to encourage visitor traffic, complicating development of a distinct, named identity for the neighborhood.

5.7. SNS data appears to add detail about specific uses and activities within an area that may otherwise be assumed within planning data gathering

In each of the four cases, SNS data analysis provides additional detail about some uses and activities that was not necessarily captured through conventional data-gathering processes. Image data appears to be especially significant in conveying important details about community activities, as images are capable of conveying clues and facts about physical conditions that are not easily expressed in textual descriptions.

This was most evident for community events such as parades or festivals, which were prominent features in the East End, Cathedral Park, and Downtown Morro Bay cases. In each of these cases, community input gathered as part of the plan development process included at least some discussion of community events, but lacked details that were evident through SNS content analysis. For example, the East End Small Area Plan talks about the importance of community events in a relatively generic manner, but analysis of Flickr images shows that the City's annual Fourth of July parade is one of the more prominent. The Downtown Morro Bay case is similar in this aspect.

Community input gathered as part of the Cathedral Park plan development process also mentioned the importance of community events within the park, but did not specifically address two longstanding events which are popular with residents across the city: the annual Jazz Festival and the Pirate Festival. In these cases, explicitly addressing the detailed characteristics of the event could help shape plans to provide specific support to popular events and extend the utility of community events.

The Lyn Lake case illustrates this point in a different manner. SNS image analysis clearly reveals that street art and graffiti murals are a dominant physical

characteristic of this neighborhood, yet these types of public art installations are not mentioned whatsoever in community input. Considering the prominence of graffiti murals in the neighborhood today, and the role that this type of art can serve in helping to define and differentiate an area, this could be considered a glaring omission in community input, and a gap that could be bridged through SNS data analysis.

5.8. Important topical themes derived from SNS analysis are not always addressed in final plan language

In each of the four case studies, some topics identified from SNS data analysis were not discussed in the resulting plan language, indicating that at least to some extent, these plan development processes could have been improved by including SNS data analysis alongside conventional research and data gathering work. To arrive at this finding, each identified theme was categorized in one of these four input categories:

- Category I: Topics identified from SNS data that did not appear in community input or the final plan language;
- Category II: Topics identified from SNS data that were also found in community input, but not the resulting plan language;
- Category III: Topics identified from SNS data that were not identified in community input, but were discussed in the final plan language; and,
- Category IV: Topics that were identified in all sources and appeared in the final plan language.

The topics identified in SNS data for each case study are listed in Table 5-7, along with their resulting classification. Some topics were indirectly or only tangentially discussed in either community input or the plan language. Where this occurred, these

indirect discussions were not considered substantial input, and therefore are not counted toward the topic classification. Only cases where the SNS topic was strongly reflected in either community input or plan language are counted toward the classification of the SNS topic.

Cases with topics in Categories I and II are those that could have benefitted most from including SNS data analysis in their plan development processes, as these plans failed to address significant topics that were identified in the SNS data. Topics in Category II are especially interesting in this regard because the inclusion of SNS data might have raised the importance of topics identified in conventional data gathering such that they would be addressed in the final plan language.

Categories III and IV reflect topics that were addressed in plan language, and thus these cases may have benefitted less from including SNS data gathering in their development processes. Still, Category III topics are interesting in that they could signal issues with the breadth of community participation in conventional data gathering efforts, as these topics were clearly expressed in SNS data but not by community members contributing input. Category IV topics represent those where no demonstrable benefit would have likely resulted from the inclusion of SNS data in the research process.

Each case study had at least some topics that were in Categories I, II, or III, representing opportunities to improve conventional data gathering processes in each of these cases. Three of the four case studies also had at least one topic in category I, representing the strongest benefit that might be derived from SNS data analysis. Of the four cases analyzed, Lyn Lake appears to have the highest potential benefit from SNS data analysis, with a number of topics in categories I and II, particularly the issue of

Table 5-6. Classification of SNS Topics in each Case Study

Identified topic from SNS Data	Found in Community Input	Found in Plan Language	Input Category
Lyn-Lake			
Residents' preference to increase the share of locally-owned businesses within the neighborhood.			I
The perceived threat of gentrification to the neighborhood's current character.			I
The prevalence and assumed value of non-sanctioned art such as "graffiti" murals within the neighborhood.			I
Negative perceptions of personal safety within the neighborhood, including rates of crime and vandalism.	•		II
The importance of art venues and events within the neighborhood, including opportunities for both visual and performance arts.	•		II
Pedestrian and bicycle accessibility within the neighborhood.	•	•	IV
East End			
The significance of community events occurring within the neighborhood.		•	III
The importance of park resources as centers of activity within the neighborhood.		•	III
The important role of sculptures and public art installations within the Park.	•	•	IV
Cathedral Park			
The high frequency of socializing that occurs within the park, particularly as a resource for dog play and exercise.			I
The importance of the park as an event venue, especially for music-related events.		^a	III
The importance of access to the river and dock facilities as a key amenity within the park.	•	^a	IV
The importance of the bridge as an iconic image anchoring the park's identity.	•	•	IV

Identified topic from SNS Data	Found in Community Input	Found in Plan Language	Input Category
The role of the park in providing essential walking, bicycling, and recreation assets for the neighborhood.	•	•	IV
Downtown Morro Bay			
The importance of viewshed connections to Morro Rock in defining the downtown identity.			I
The centrality of the downtown area compared to attractions such as the Embarcadero, Morro Rock, and Highway 1.		•	III
The importance of the downtown area as a significant events venue.	•	•	IV

non-sanctioned graffiti art within the neighborhood which was strongly represented in SNS image data, and the negative impacts of redevelopment and gentrification which were strongly represented in SNS textual data. The exclusion of these topics from the final plan language could indicate a significant disconnect between neighborhood sentiment and the long-term vision for the area elicited by planners in the adopted Small Area Plan document.

East End appeared to have the least potential benefit of all of the cases, with no topics identified in Category I or II. East End also had the lowest total amount of SNS data found, which partially explains this finding. In the case of Cathedral Park, which had the highest amount of SNS data found, only two of the five topics identified in SNS data were not classified in Category IV, representing some potential for improvement of that Plan's development process, but perhaps less of a net benefit than that found in Lyn Lake

5.9. *Summary*

These findings developed across cases help to illustrate how SNS data can complement traditional community engagement and data gathering techniques, and the conditions where SNS analysis could be most helpful during a planning project.

Although it is clear from the individual and cross-case findings that SNS data analysis can reinforce conventional data-gathering techniques and refine planners' perceptions of activity within an area, it is also clear that the application of SNS data analysis techniques is not equally beneficial in each case. The use of this new tool must be kept within the context of broader planning concerns that focus on how to use SNS data in concert with traditional data, as discussed with a number of other conclusions and implications in Chapter 6.

6 CONCLUSIONS AND IMPLICATIONS

The findings from individual and collective case study analysis lead to three primary conclusions discussed in this Chapter. The implications of these conclusions are more nuanced, however, and point to changes needed in the way that planners approach emerging technologies in everyday planning practice, as well as improving the integration of emerging technology in planning education and training. Continued research and an ongoing effort to maintain awareness of SNS trends are also important future considerations. This Chapter discusses these conclusions, implications, and future directions for planning education and practice.

6.1. Key Conclusions

Three primary conclusions emerge from this study: (i) that SNS data appear to complement traditionally-gathered input derived from community engagement techniques, (ii) that SNS data gathering practices are not direct replacements for traditional participatory methods, and (iii) that the effectiveness of SNS data analysis in community planning projects can vary widely depending on the characteristics of the project area in which they are applied. These conclusions each represent opportunities

to improve planning research and data-gathering techniques through the most effective application of SNS data techniques.

6.1.1. SNS data appear to complement traditionally-gathered community input.

Each of the four case studies demonstrated that the addition of SNS data can complement data gathered through traditional community engagement techniques, in three primary themes. In some cases, SNS data can identify issues and community sentiments that do not emerge in conventional participatory techniques for any number of reasons. In other cases, SNS data can reinforce the importance or priority of issues that are identified through traditional engagement, potentially raising the likelihood that these issues are addressed in final plan language. Finally, SNS data can provide additional detail regarding current activities, uses, and trends within communities that might not be easily gathered in a conversational manner, particularly through the analysis of image data gathered from SNS platforms.

In all four cases studied, analysis of SNS data identified issues that were not otherwise raised in the community engagement activities undertaken during plan development (described earlier as Category I and III topics). The opportunity for SNS data analysis to extend the effectiveness of community plan development is highest in this context, because of the additional issues raised that can contribute to refinement of plan language to more effectively meet community needs. Planners have historically worked to refine and extend participation and engagement in plan development, and SNS data analysis appears to be yet another method that can be used toward this goal, when effectively utilized.

Although there were fewer cases where SNS data demonstrably added to the importance of issues raised in traditional data-gathering work (described earlier as

Category II topics), the significance of these issues points to the utility of SNS data as a sort of check in this manner. Had SNS data analysis been used in the Lyn-Lake case, for example, planners may have recognized the importance of addressing negative perceptions of redevelopment in the neighborhood and the value placed by citizens on arts venues and performance events. Particularly with the issues of redevelopment impacts in local communities, being aware of these community sentiments and proactively addressing them in plan language would serve to assure residents that their concerns are indeed being adequately addressed, and potentially avoid contentious deliberations during public plan review resulting from the omission of important issues.

Finally, and perhaps most importantly, the inclusion of SNS data analysis can provide an additional level of detail about community activities and behavior that can improve the likelihood of plan goals and objectives being achieved. This is perhaps most significant with image data: seeing pictures of events and uses within a community can illustrate to planners more detailed, and perhaps nuanced, characteristics of activity in an area than a simple textual description. In this case, as the popular saying goes, a picture really could be worth a thousand words.

6.1.2. SNS data gathering is not a replacement for traditional engagement techniques.

Analyzing SNS data can be a powerful addition to data gathering practices, but despite this power, it is not a direct replacement for the multitude of engagement techniques currently employed in planning practice. This should come as no surprise – indeed, few if any emerging or experimental techniques have been accepted as true replacements for other means, and in all of the cases examined, a variety of participatory approaches were utilized to improve the level of engagement between planners and the community. SNS data analysis is no different in this regard.

Much has been made of the interactive component of conventional participatory techniques such as community workshops and charrettes, chiefly due to the new ideas and understandings that can arise from the direct interaction of participants in participatory events. SNS participation, although arguably a collaborative activity, is not necessarily interactive, and is rarely based on explicit, synchronous communication between participants. Some of the best ideas in planning can arise from community workshops where residents gather and interact to develop ideas, express vision, and evaluate different alternatives for the future. Although SNS platform users often express their sentiments and use the tools as a storytelling means, it is much more difficult to achieve mutual understanding and a basis for consensus through the examination of SNS text and images alone: achieving mutual understanding requires a level of synchronous interactivity that SNS platforms are not necessarily designed to deliver.

In addition, overemphasis on SNS data gathering techniques can introduce bias in engagement programs due to the characteristics of SNS users and the “digital divide” discussed in Chapter 2. Excluding SNS data analysis from data-gathering work could result in missing key issues or details that should be considered during plan development, but relying too heavily on SNS data analysis at the expense of community workshops, charrettes, public comment, or other more conventional means would likely over-prioritize the contributions of the population which have access to and readily participate in SNS activities. The goal here is to achieve a balance and utilize SNS data analysis in a way that extends the other input received during the plan.

6.1.3. SNS data analysis is most effective in areas with a well-defined identity.

One of the clearest conclusions from this study is that not all planning projects can equally benefit from the integration of SNS data analysis. Project areas that have an

existing, well-defined identity are most likely to benefit from the application of SNS data. Thus, evaluating the characteristics of individual project area is important before deciding to proceed with SNS data analysis.

Determining whether an area has a well-defined identity is highly subjective, but as shown in this study, there are some important indicators to consider. The projects in this study that had the highest volume of SNS data were those with a generally-accepted, popular name, and those that were highly imageable using the rubric described by Lynch (1960). These are important indicators for two reasons: first, these areas are probably more likely to have a higher level of activity, and therefore are more likely to have users contributing related SNS data. Second, having a generally-accepted name provides the underlying basis for organizing and retrieving the SNS data related to these locations, particularly when using spatially-associated but not georeferenced SNS platforms such as Yelp.

In practice, there are a number of circumstances where the use of SNS data should probably not be considered. For example, areas without a high level of current activity or a well-defined name are less likely to have significant amounts of retrievable SNS data. Neighborhoods which are not highly-imageable or do not have significant attractions to draw outside users are also less likely to have actionable quantities of SNS data. Of course, individual circumstances may vary across different project areas, but the decision to proceed with SNS data analysis should be guided, in part, by their characteristics in this regard to ensure that effort expended is likely to deliver an actionable result.

6.2. Key Implications and Future Directions

The conclusions discussed in section 6.1 present a number of broader implications for the field of planning, most importantly concerning the use of emerging technologies such as SNS platforms in everyday planning practice, emphasis on technology awareness and competency as a key professional aptitude, and the need for further research to better understand how SNS technologies can extend planning processes. These implications will determine, to a large degree, the extent to which planners can successfully apply the lessons learned in this study to improve professional practices and outcomes.

6.2.1. Planners should begin to consider SNS data analysis in community engagement efforts.

Planning practitioners are beginning to embrace SNS technologies as communications tools, but there are few examples of practitioners using SNS technologies as data inputs rather than simply another messaging medium. As a result, there is a significant amount of data that is available to planners but currently excluded from use. This data, as shown in the examples in this study, could be used to improve the effectiveness of community planning work and improve community perceptions of planning activities.

As a result, planners should begin to understand and consider SNS data analysis as yet another engagement method alongside conventional techniques. In order to achieve this objective, planners will need to begin understanding the capabilities of SNS technologies and their applicability to their own communities. In addition, planning departments will need to begin to embrace data collected through Web 2.0 paradigms, rather than seeing online technologies as simply a messaging

medium. At the same time, planners should resist the urge to adopt SNS data analysis in place of more conventional (and, perhaps, more costly) community engagement techniques, in order to avoid unintentionally excluding some participants that are not frequent SNS contributors.

6.2.2. SNS technology competency and ongoing awareness need to be embraced as core professional skills.

Technology is not a new tool in planning practice: planners use specialized technologies such as GIS and Computer-Aided Design and more generalized tools including e-mail and the World Wide Web on an everyday basis. Practitioners have largely accepted the use of these types of technology as key professional skills, and the academy has responded by including these technologies (particularly specialized technologies) in curricula at all levels of planning education.

In order to apply SNS data analysis in everyday practice, planners will need to embrace SNS competency in a similar fashion. It is impossible to undertake a project of SNS data analysis without a firm understanding of how Web 2.0 technologies are fundamentally different from traditional publish-and-subscribe models, and with no awareness of current trends and emerging SNS toolsets that could aid in planning practice. Thus far, little emphasis has been placed on these tools at either the professional or academic levels, but such emphasis is necessary in order to adapt to new technical skills needed to use these tools.

It is vital that professional planners not view SNS competencies as an issue solely for the academy to solve, as SNS competency has much more to do with ongoing awareness than it does the specific use of a finite and stable set of tools. The SNS landscape is neither finite nor stable: the tools used in this study are less than a

decade old, and none of them have remained static in terms of their capability or their prevailing patterns of use. Competency in the use of SNS platforms is absolutely not something that can be simply achieved: it must be maintained through ongoing awareness, exploration, and experimentation in practice, not just in concept.

Most critically, as SNS usage continues to expand rapidly, it is likely that constituents will come to expect governments, and in turn planning departments, to use these tools as communications and engagement means. Failing to recognize this trend is a significant risk for the profession, as it damages our relevancy, accessibility, and ultimately, our perception in the eyes of those we aim to serve.

6.2.3. Further research is required to more fully understand how emerging technologies can be better integrated into planning practice.

Just as professional competency with SNS technologies is a moving target, so is our overall understanding of how to apply these emerging technologies into planning practice. This study presents just the beginning of this understanding, but further research is necessary to refine and expand our knowledge of how technology can complement and improve our ongoing work as planners.

For example, further research should be conducted into how planners can more easily gain access to the wealth of spatially-referenced SNS data, and how the application of this data can bridge gaps in participation and representation in community engagement techniques. More research is necessary to explore the demographics and usage patterns of SNS data within the context of planning research. Finally, further examination is needed to determine how the unique capabilities of SNS platforms can create new and more powerful engagement techniques, continuing the

work already done to utilize 3D modeling and experiential technologies in face-to-face community workshops.

In short, this study is just the beginning of the research required to leverage these tools and fully embrace the groundbreaking capabilities of SNS technology into planning practice.

6.3. Closing

Emerging technologies such as Social Networking are changing how the world communicates and interacts. In the span of just a decade, the communications capabilities of ordinary citizens have been radically reshaped toward a paradigm of broad-based content creation, sharing, communication, and rapid dissemination. Millions of users around the globe have fully embraced this new paradigm as fundamental way in which they communicate and interact.

Planners have a responsibility to respond in kind, both to maintain their relevancy in this new technology-fueled communicative world, and to continually improve their ability to work in the broader public interest. The profession of planning has never existed in a vacuum, and professional practice has historically evolved to address changing conditions, expectations, and obligations in the eyes of the citizenry. This shift is no exception, and planners have no logical choice but to adapt their practices yet again to embrace emerging technology.

These technologies offer exciting, powerful new capabilities, but only to those who choose to utilize them. Planners must begin to embrace SNS technologies to maintain their ability to serve the public interest, and to continue to innovate and excel in empowering communities to achieve their future goals.

BIBLIOGRAPHY

- Agger, A., & Löfgren, K. (2008). Democratic Assessment of Collaborative Planning Processes. *Planning Theory*, 7(2), 145-164.
- Boyd, D. (2008). Facebook's Privacy Trainwreck: Exposure, Invasion, and Social Convergence. *Convergence: The International Journal of Research into New Media Technologies*, 14(1), 13-20. doi: 10.1177/1354856507084416
- Cheong, M., & Lee, V. (2009). Integrating web-based intelligence retrieval and decision-making from the twitter trends knowledge base. *Proceeding of the 2nd ACM workshop on Social web search and mining* (pp. 1-8). Hong Kong, China: ACM. doi: 10.1145/1651437.1651439
- City of Denver. (2002). Blueprint Denver: An Integrated Land Use and Transportation Plan. Retrieved from <http://denvergov.org/Portals/646/documents/BlueprintDenver.pdf>
- City of Minneapolis. (2009a). Lyn-Lake Small Area Plan. Retrieved from http://www.ci.minneapolis.mn.us/cped/docs/Lyn_Lake_Small_Area_Plan_Final_Draft.pdf
- City of Minneapolis. (2009b). Lyn-Lake Small Area Plan (Appendicies). Retrieved from http://www.ci.minneapolis.mn.us/cped/docs/Lyn_Lake_Appendices_Final_Draft.pdf
- City of Portland. (2007). visionPDX Community Engagement Report. Retrieved from http://www.visionpdx.com/reading/engagement_report.php
- City of Portland. (2009). Cathedral Park Master Plan. Retrieved from <http://www.portlandonline.com/parks/index.cfm?a=226678&c=51821>
- City of Tulsa. (2010). Tulsa Draft Strategic Plan. Retrieved from <http://www.planitulsa.org/files/Strategic-Plan-web-030810.pdf>

- Entner, R. (2010, March 26). Smartphones to Overtake Feature Phones in U.S. by 2011. *nielsenwire (The Nielsen Company)*. Retrieved from <http://blog.nielsen.com/nielsenwire/consumer/smartphones-to-overtake-feature-phones-in-u-s-by-2011/>
- Fogel, J., & Nehmad, E. (2009). Internet social network communities: Risk taking, trust, and privacy concerns. *Computers in Human Behavior*, 25(1), 153-160. doi: 10.1016/j.chb.2008.08.006
- Foth, M., Bajracharya, B., Brown, R., & Hearn, G. (2009). The Second Life of urban planning? Using NeoGeography tools for community engagement. *Journal of Location Based Services*, 3(2), 97. doi: 10.1080/17489720903150016
- Fox, S., Zickuhr, K., & Smith, A. (2009, October). Twitter and Status Updating, Fall 2009. Pew Research Center. Retrieved from <http://www.pewinternet.org/Reports/2009/17-Twitter-and-Status-Updating-Fall-2009.aspx>
- Goldfarb, A., & Prince, J. (2008). Internet adoption and usage patterns are different: Implications for the digital divide. *Information Economics and Policy*, 28, 2-15.
- Gonzalez, P. A., Weinstein, J. S., Barbeau, S. J., Labrador, M. A., Winters, P. L., Georggi, N. L., et al. (2010). Automating mode detection for travel behaviour analysis by using global positioning systems-enabled mobile phones and neural networks. *Intelligent Transport Systems, IET*, 4(1), 37-49. doi: 10.1049/iet-its.2009.0029
- Gordon, E., & Koo, G. (2008). Placeworlds: Using Virtual Worlds to Foster Civic Engagement. *Space and Culture*, 11(3), 204-221. doi: 10.1177/1206331208319743
- Gordon, E., & Manosevitch, E. (2010). Augmented Deliberation: Merging Physical and Virtual Interaction to Engage. *New Media & Society*. doi: 10.1177/1461444810365315
- Graham, J. (2006, February 27). Flickr of idea on a gaming project led to photo website. *USA Today*. Retrieved from http://www.usatoday.com/tech/products/2006-02-27-flickr_x.htm
- Guzzetta, J. D., & Bollens, S. A. (2003). Urban Planners' Skills and Competencies: Are We Different from Other Professions? Does Context Matter? Do We Evolve? *Journal of Planning Education and Research*, 23(1), 96-106. doi: 10.1177/0739456X03255426
- Hill, S. (2011, January 5). Location-Based Services Are Becoming Social Network Outcasts. *TechNewsWorld*. Retrieved from <http://www.technewsworld.com/story/Location-Based-Services-Are-Becoming-Social-Network-Outcasts-71578.html>

- Van House, N., Davis, M., Takhteyev, Y., Good, N., Wilhelm, A., & Finn, M. (2004). From “what” to “why”: The social uses of personal photos. Presented at the CSCW 2004: The ACM Conference on Computer Supported Cooperative Work,, Chicago, IL: Association for Computing Machinery.
- Jackson, S. (2008). The City from Thirty Thousand Feet: Embodiment, Creativity, and the Use of Geographic Information Systems as Urban Planning Tools. *Technology and Culture*, 49(2), 325-346. Retrieved September 29, 2010,
- Jansen, B. J., Zhang, M., Sobel, K., & Chowdury, A. (2009). Twitter power: Tweets as electronic word of mouth. *Journal of the American Society for Information Science and Technology*, 60(11), 2169-2188. doi: 10.1002/asi.21149
- Kakihara, M. (2010). Understanding Real-Virtual Dynamics of Human Behavior from the Action Stream Perspective. *PACIS 2010 Proceedings*, 34.
- Kwak, H., Lee, C., Park, H., & Moon, S. (2010). What is Twitter, a social network or a news media? *Proceedings of the 19th international conference on World wide web* (pp. 591-600). Raleigh, North Carolina, USA: ACM. doi: 10.1145/1772690.1772751
- Lexington-Fayette Urban County Government. (2009). East End Lexington Small Area Plan. Retrieved from <http://www.lexingtonky.gov/Modules/ShowDocument.aspx?documentid=7562>
- Lobo, D. G. (2005). A City is Not a Toy: How SimCity Plays with Urbanism. London School of Economics and Political Science Cities Programme: Architecture and Engineering Discussion Paper Series.
- Longueville, B. D., Smith, R. S., & Luraschi, G. (2009). “OMG, from here, I can see the flames!”: a use case of mining location based social networks to acquire spatio-temporal data on forest fires. *Proceedings of the 2009 International Workshop on Location Based Social Networks* (pp. 73-80). Seattle, Washington: ACM. doi: 10.1145/1629890.1629907
- Lynch, K. (1960). *The Image of the City*. Cambridge: MIT Press.
- McManus, J. (2010). Small Physics in Social Change: Chattanooga’s Visioning Process. *National Civic Review*, 99(3), 17-21.
- Mitchell, S. R. (2007, July 25). It’s time for city to go from talk to action. *The Oregonian (Portland, OR)*, C1.
- Murphy, T. (2007, September 18). Potter’s Process. *Portland Tribune*. Retrieved November 2, 2009, from http://portlandtribune.com/news/story.php?story_id=119006800235547300
- O’Reilly, T. (2007). What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software. *Communications & Strategies*, 1(17), 17-37. Retrieved October 28, 2010,

- Orlowski, A. (2004, October 13). Yelp! A viral recommendation system you can't resist? *The Register*. Retrieved from http://www.theregister.co.uk/2004/10/13/viral_yelp/
- Pentland, A. (2009). The Global Information Technology Report 2008-2009: Mobility in a Networked World. (S. Dutta & I. Mia, Eds.). World Economic Forum.
- Rafoss, T., Sælid, K., Sletten, A., Gyland, L. F., & Engravslia, L. (2010). Open geospatial technology standards and their potential in plant pest risk management--GPS-enabled mobile phones utilising open geospatial technology standards Web Feature Service Transactions support the fighting of fire blight in Norway. *Computers and Electronics in Agriculture*, 74(2), 336-340. doi: 10.1016/j.compag.2010.08.006
- Rebello, J. (2010, July 16). Four Out of Five Cell Phones to Integrate GPS by End of 2011. iSuppli Corporation. Retrieved from <http://www.isuppli.com/Mobile-and-Wireless-Communications/News/Pages/Four-out-of-Five-Cell-Phones-to-Integrate-GPS-by-End-of-2011.aspx>
- Reitsma, R. (2010, December 10). The Data Digest: Who Uses Location-Based Services? *Forrester Blogs*. Retrieved from http://blogs.forrester.com/reineke_reitsma/10-12-10-the_data_digest_who_uses_location_based_services
- Rejaie, R., Torkjazi, M., Valafar, M., & Willinger, W. (2010). Sizing up online social networks. *IEEE Network*, 24(5), 32-37. doi: 10.1109/MNET.2010.5578916
- Reynolds, W. N., Weber, M. S., Farber, R. M., Corley, C., Cowell, A. J., & Gregory, M. (2010). Social media and social reality. *Intelligence and Security Informatics (ISI)*, 2010 IEEE International Conference on (pp. 221-226). Presented at the Intelligence and Security Informatics (ISI), 2010 IEEE International Conference on. doi: 10.1109/ISI.2010.5484733
- Sadeh, N., Hong, J., Cranor, L., Fette, I., Kelley, P., Prabaker, M., et al. (2008). Understanding and capturing people's privacy policies in a mobile social networking application. *Personal and Ubiquitous Computing*, 13(6), 401-412. doi: 10.1007/s00779-008-0214-3
- Sakaki, T., Okazaki, M., & Matsuo, Y. (2010). Earthquake shakes Twitter users: real-time event detection by social sensors. *Proceedings of the 19th international conference on World wide web* (pp. 851-860). Raleigh, North Carolina, USA: ACM. doi: 10.1145/1772690.1772777
- Sandercock, L. (1998). *Toward Cosmopolis*. West Sussex, England: John Wiley and Sons.
- Sanoff, H. (2006). Multiple views of participatory design. *METU Journal of the Faculty of Architecture*, 23(2), 131-143.

- Seeger, C. J. (2008). The role of facilitated volunteered geographic information in the landscape planning and site design process. *GeoJournal*, 72(3-4), 199-213. doi: 10.1007/s10708-008-9184-2
- Sheppard, Z. (2010, September 19). 5,000,000,000. *Flickr Blog*. Retrieved from <http://blog.flickr.net/en/2010/09/19/5000000000/>
- Spellman, J. (2010). Heading off disaster, one tweet at a time. *CNN*. Retrieved from <http://edition.cnn.com/2010/TECH/social.media/09/22/natural.disasters.social.media/index.html?iref=allsearch>
- Steins, C., & Stephens, J. (2008, April). Building Cities in the Virtual World. *Planning*. Retrieved from <http://www.planning.org/planning/2008/apr/web2oh.htm>
- Stoppelman, J. (2010, December 15). 2010: Yelp by the numbers. *Yelp Web Log*. Retrieved from <http://officialblog.yelp.com/2010/12/2010-yelp-by-the-numbers.html>
- Toker, Z., & Toker, U. (2006). Community Design in its Pragmatist Age: Increasing Popularity and Changing Outcomes. *METU Journal of the Faculty of Architecture*, 23(2), 155-166.
- Twitter, Inc. (2010, February 22). Measuring Tweets. *Twitter Blog*. Retrieved October 28, 2010, from <http://blog.twitter.com/2010/02/measuring-tweets.html>
- Wang, Xiaohu. (2001). Assessing Public Participation in U.S. Cities. *Public Performance & Management Review*, 24(4), 322-336. Retrieved November 5, 2009,
- Wang, XiaoHu, & Wan Wart, M. (2007). When Public Participation in Administration Leads to Trust: An Empirical Assessment of Managers' Perceptions. *Public Administration Review*, 67(2), 265-278. doi: 10.1111/j.1540-6210.2007.00712.x
- Xu, K., Liao, S. S., Song, Y., & Liu, L. (2010). Mining User Opinions in Social Network Webs. *The Fourth China Summer Workshop on Information Management* (p. 39).
- Yelp, Inc. (n.d.). Frequently Asked Questions. Retrieved from <http://www.yelp.com/faq>
- Yin, R. K. (2003). *Case Study Research: designs and methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Zeisel, J. (1981). *Inquiry by Design*. Cambridge: Cambridge University Press.