Online Video as a Tool for Planning Education and Engagement:

A Content Analysis of U.S. City Planning Departments' YouTube Channels

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Abstract

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This study explores the potential for city planning departments to more deeply engage citizens in public planning processes by producing and sharing educational videos through such online platforms as YouTube. Many academic and professional fields have already recognized and adopted YouTube as a dynamic medium for education, however planning departments in the United States' largest cities have yet to fully take advantage of this social media platform. This study uses content analysis to describe and categorize the digital video content published on seven city planning departments' YouTube channels. In addition, this study illuminates relationships between video popularity—measured in number of views—and video length, production quality, production elements (e.g. voiceover, motion graphics or animation, background music, etc.), the degree of production effort (or cost) required on the part of the content creator, and the presence or absence of an explicit call to action.

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1. Introduction

In the 11 years since YouTube's founding in 2005, the online video-sharing website has gained over one billion users, and for three straight years, "growth in watch time on YouTube has accelerated and is up at least 50% year over year" ("Statistics" n.d.). Though it was originally created as a platform simply to allow laypeople to easily upload, publish, and share videos, as a growing number of users are spending more time each day on YouTube, many academics and industry professionals have recognized the website's potential for disseminating educational content. *Khan Academy*, created by Salman Khan in 2006, was one of the first YouTube channels dedicated exclusively to producing and sharing educational videos. Following the success of Khan Academy, hundreds of educational channels have been created, garnering millions of subscribers and billions of views. *Crash Course*, the second most subscribed educational channel on YouTube has, as of this writing, over 4.3 million subscribers and nearly 386 million views ("YouTube Top 100 Most Subscribed Education Channels List" n.d.). (The top most subscribed educational YouTube channel is *LittleBabyBum*, which posts animated music videos for children's songs.) *Crash Course* presents courses (or seasons) focused on topics including world history, chemistry, English literature, and U.S. government, and videos are used regularly by teachers in high school classrooms, as well as by students studying for exams. Other popular educational channels, such as *Veritasium*, *Numberphile*, and *Smarter Every Day*, create content specifically focused on science, technology, engineering, or math (STEM) concepts, while others, such as *CGP Grey* and *TED-Ed*, cover a wide variety of subjects.

While many other video-sharing websites, such as Vimeo, Dailymotion, and LiveLeak, exist and provide similar features, YouTube is the most widely used platform around the world, which is why I have chosen it as the subject of my research. For comparison, Vimeo is the

second most-used video-sharing website after YouTube, with approximately 170,000,000 users ("Let's do something amazing together" n.d.).

The original intent of this research was to measure the effectiveness of U.S. planning departments' YouTube content in educating and engaging youth in urban planning issues, and to offer recommendations for improvement. After reviewing the YouTube content published by planning departments in the 30 largest U.S. cities, I found that a) there was not enough official planning department-produced educational YouTube content available from which to draw meaningful recommendations, and b) the only available metric for directly comparing the existing content was number of views. In short, I found that my original research question proposed to measure the effectiveness of a tool that had not yet been meaningfully employed. Further, due to a lack of available demographic data to segregate video viewers by age, I was unable to examine "youth" as a population (roughly defined as people ages 18-34), separate from other video viewers. In lieu of the empirical data necessary to complete my initial undertaking, I turned then to a more descriptive and exploratory approach.

The ultimate purpose of my research is twofold: to investigate where city planning departments stand in relation to early adopters—both in the public sector and in other professional fields and academic disciplines—of YouTube as an educational and engagement tool, and to describe the nature and quality of digital video content shared through U.S. planning departments' YouTube channels. Based on these observations, I then draw out patterns amongst the most popular videos published on the studied planning department YouTube channels and offer directions for future research. While popularity, measured in terms of number of views, is a poor proxy for measuring educational effectiveness, at this time it is the best available metric to illustrate the potential for educational engagement. In other words, while viewership cannot tell

us how much or how well viewers learned about a particular issue as a result of watching a video, it can tell us how many opportunities for education that video has created. After all, no matter how optimally a video is produced or shared, it has no educational value unless it is watched.

To investigate where city planners stand among the early adopters of YouTube as an educational and engagement tool, I organized a portion of my literature review and initial data collection under the following secondary questions:

- Across academic and professional disciplines, what is the state of published literature relating to YouTube's use as an educational tool? How does the literature published by these other fields compare to that from the planning field?
- Of the 30 most-populated U.S. cities, which planning departments have YouTube channels? How does the number of planning department YouTube channels compare to the number of citywide or other city department YouTube channels?

To describe the nature and quality of the studied planning departments' YouTube channels and published content, I organized my content analysis under the following secondary questions:

- What are the basic characteristics of the studied YouTube channels? How do these characteristics differ between the most and least popular channels?
- What degrees of effort and cost are reflected in the video content published on these planning departments' YouTube channels? What degree of production costs are reflected in the most/least popular videos?

- What production elements and production quality are present in these planning departments' YouTube channels? What production elements and production quality are present in the most/least popular videos?
- What engagement elements are present in these planning departments' YouTube channels? Which engagement elements are present in the most/least popular videos? How many engagement elements are present in the most/least popular videos?

Each of these secondary questions could, on their own, serve as the basis for separate bodies of research, but because there currently exists very little precedent research on the use of YouTube by city planning departments, I have chosen to address these questions together, favoring breadth over depth. In the future, as more planning departments start their own channels and post their own original educational content, my hope is that this paper can serve as a starting point for further research on this topic. It is important to note here that while not included within the scope of this paper, planning departments' sharing and promoting of their YouTube videos, alongside other outreach materials and programs, should be carried out in a manner that is as strategic and thoughtful as the production of the videos themselves. Examining successful practices for integrating YouTube videos into existing outreach, education, and engagement efforts is, itself, a rich subject for future study, and one which is deserving of more attention than it will receive in this paper.

2. Literature Review

2.1. YouTube as a tool for communication and education

In their study "Using Video to Build an Organization's Identity and Brand: A Content Analysis of Nonprofit Organizations' YouTube Videos", Richard D. Waters and Paul M. Jones (2011) point out several reasons for nonprofits to use videos in their outreach and branding efforts, reasons which could easily be translated to city planning departments. The first of these reasons is that "videos enhance the public's impression of the organization's products or services, put a human face on the organization, and ultimately build the brand" (Waters, Jones 2011, 249). While the focus of my research is on using videos for educational purposes, it can be beneficial for planning departments to put a human face on their own policies, plans, and services through YouTube videos. Another reason YouTube videos are promoted in Waters' and Jones' paper as an effective way to build an organization's identity is that the "verbal, vocal, and visual are brought together in the video form. […] These three characteristics of communication were found to have the strongest effect on recipients of the message in terms of remembering the key messages" (Waters, Jones 2011, 249). Bringing together three different communication methods into one video not only helps audiences internalize nonprofit organizations' brand identities, but it also helps audiences of city planning department YouTube videos to learn and retain information about new planning initiatives or policies.

The third argument Waters and Jones make for nonprofits' use of YouTube is that "the comment and reply feature of YouTube enables the device to be used as a legitimate two-way communication channel" (2011, 250). Though the most popular planning department YouTube channels today make almost no use of the comment feature (see "Findings"), this potential for two-way communication between city planners and residents is worth greater exploration. Yan

Tian's "Organ Donation on Web 2.0: Content and Audience Analysis of Organ Donation Videos on YouTube" (2010) reiterates the potential uses inherent in YouTube's two-way communication format. Just as Tian was able to use YouTube's built-in audience response system to gauge viewers' reactions to the video's content, planning departments may take advantage of comments and ratings to monitor, evaluate, and improve online public education and engagement efforts. Tian's article posits that health communicators, and we may extend that recommendation to city planning departments, should take advantage of the reciprocal nature of YouTube by "interacting with audience members instead of setting [static message] frames for the audience" (Tian 2010, 245). Traditional outreach and engagement processes in planning seek exactly this kind of dynamic and interactive communication and feedback, which is why YouTube is not only an appropriate, but—given its relative efficiency in terms of reaching large numbers of community members—perhaps advantageous, platform.

Lynn Bell and Glen L. Bull, in their article "Digital Video and Teaching" (2010), also identified several benefits to using digital video for educational purposes, particularly in classroom settings. They noted that "some students are beginning to employ [YouTube] as an initial point of reference when they have questions about a topic" (Bell, Bull 2010, 1). Today, with much greater volumes of high-quality, trusted educational content on YouTube, students are even more likely to look to this online source as a legitimate place to find answers. The benefits of digital video for classroom learning described by Bell and Bull include:

- With digital video, teachers have the ability to isolate short segments (i.e. 30 seconds to three minutes) with the most relevant information, as well as the ability to replay segments for closer analysis.

- Digital video can incorporate a wide range of elements, including "graphical or numeric data", "still images with narration and music (including maps, documents, audio clips, and video clips), animations, and screencasts (i.e. an edited recording of a computer screen) in addition to traditional video" (Bell, Bull 2010, 1).

2.2. Planning and e-government literature related to YouTube

When searching specifically for urban planning literature studying the use of YouTube as an educational or engagement tool, I found a relative dearth compared to the number of publications from other disciplines (see subheading 2.3 below). In a query of all archived issues of the *Journal of the American Planning Association* (*JAPA*), performed using both ProQuest and Taylor & Francis Online databases on May 28, 2016, only one relevant result was produced for the search term "social media". No results were produced for the search term "YouTube". The one article published by *JAPA* related to social media is "Planning and Social Media: A Case Study of Public Transit and Stigma on Twitter" (Schweitzer 2014). The most relevant *JAPA* article I could find relating to digital video as a tool for education was "Planning with Hypermedia: Combining Text, Graphics, Sound, and Video" (Wiggins, Shiffer 1990). This article was published in 1990, a full 15 years before YouTube was even founded. An image and caption taken from this article, shown in Figure 1 below, along with the use of the term "hypermedia", clearly illustrate how outdated the content in this article is.

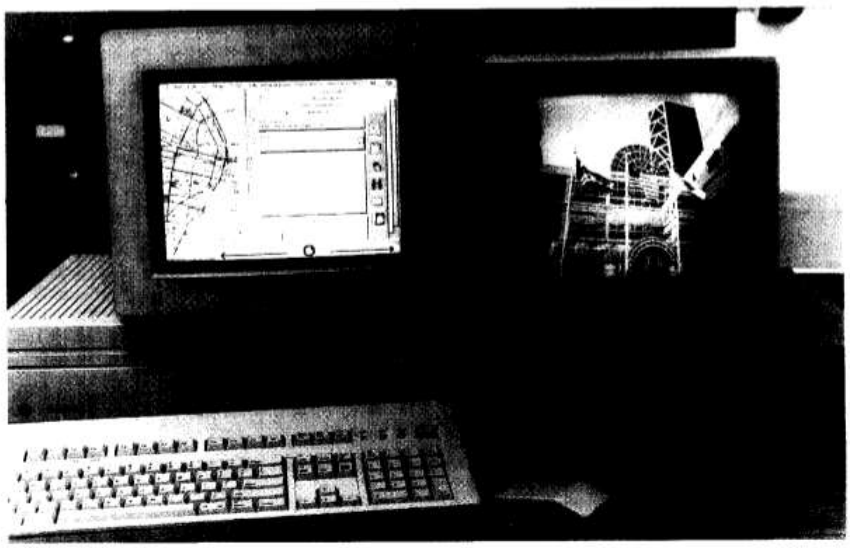


FIGURE 4: A photograph of the hardware setup for the Riverfront 2000 project. Notice the use of a separate monitor to display the video sequences.

APA JOURNAL 232 SPRING 1990

Figure 1. Image and caption from "Planning with Hypermedia: Combining Text, Graphics, Sound, and Video", published in *Journal of the American Planning* Association (Wiggins, Shiffer 1990, 232)

Queries of other peer-reviewed journal databases related to urban planning produced similarly few results. In the articles where YouTube was directly mentioned—five results from *Journal of Planning Education and Research* and two results from *Journal of Planning Literature*—the term was mentioned no more three times, and most often within a list of other social media tools, rather than as a subject of study itself. Facebook, on the other hand, has been widely studied and evaluated as an engagement tool within the planning literature (Evans-Cowley, Hollander 2010; Evans-Cowley 2010a, 2010b; Mandarano, Meenar, Steins 2010; Oliveira, Welch 2013). Despite being founded only a year before YouTube, Facebook has so far proven more popular than YouTube, both in terms of usage by Digital Natives as a source of news and information ("How Millennials Get News" 2015), and by government agencies as a platform for promoting their online content and connecting with stakeholders and audiences (Mergel 2012).

Given this relative lack of specific literature on the educational use of YouTube in planning theory and practice, I find it helpful to situate my research within the more robust discourse surrounding e-government and governments' use of social media, in general. In the introduction to a special issue of *Planning Practice and Research* (Kleinhans et al. 2015), the editors define e-government as the use of new digital technology and social media with the goal of improving citizen-government interactions and relationships. These social media tools, the editors argue, have "spurred a demand for new forms of participatory planning and self-organizing governance by citizens" (Kleinhans et al. 2015, 239). Kleinhans et al. describe three potential communication strategies employed by governments who have turned to using social media and social networking tools: "(1) representation; (2) citizen engagement; and (3) networking with the public" (2015, 241).

These three strategies echo Innes Mergel's work studying e-government at the federal level, in which she identifies three primary "missions" driving social media interactions in the public sector: transparency, participation, and collaboration (Mergel 2013a). Transparency, participation, and collaboration were the three core principles called out in the Obama administration's Open Government Initiative (OGI) (2009) which, Mergel and Bretschneider (2013) argue, led to the "ongoing wave of ICT [information and communications technology] innovation and adoption in U.S. [federal] government" (391). These principles, their goals, tactics, and outcomes are summarized in Table 1 below.

Table 1. Adaptation of Innes Mergel's "A framework for interpreting social media interactions in the public sector" (2013a)

Mission	Goal	Tactics	Outcome
Transparency: providing information for citizens about what their Government is doing	Information education	One-way push	Accountability trust
Participation: increasing opportunities to participate in policymaking and provide Government with the benefits of their collective expertise and information	Engagement	Two-way pull	Consultation, deliberation, satisfaction
Collaboration: soliciting public feedback to assess and improve their level of collaboration and to identify new opportunities for cooperation	Cross-boundary	Networking Co-design	Community building

Figure 2 illustrates a summary of what Mergel and Bretschneider call "historical waves of e-government" (2011, 2012, 2013b). The most recent wave, beginning in the 2000s and evolving after the launch of the OGI in 2009, shows a shift in focus from digital service and program delivery to an emphasis on citizen participation and collaboration through social media platforms (Mergel 2013a). Mergel calls this time in the e-government movement an "early experimentation phase with social media metrics" (2013a, 332). More recently, Kleinhans et al. argue that when it comes to effectively using social media to encourage engagement in planning issues, "there is much wishful thinking, but little empirically validated knowledge in this emerging field of study of digitally supported engagement" (2015, 238).

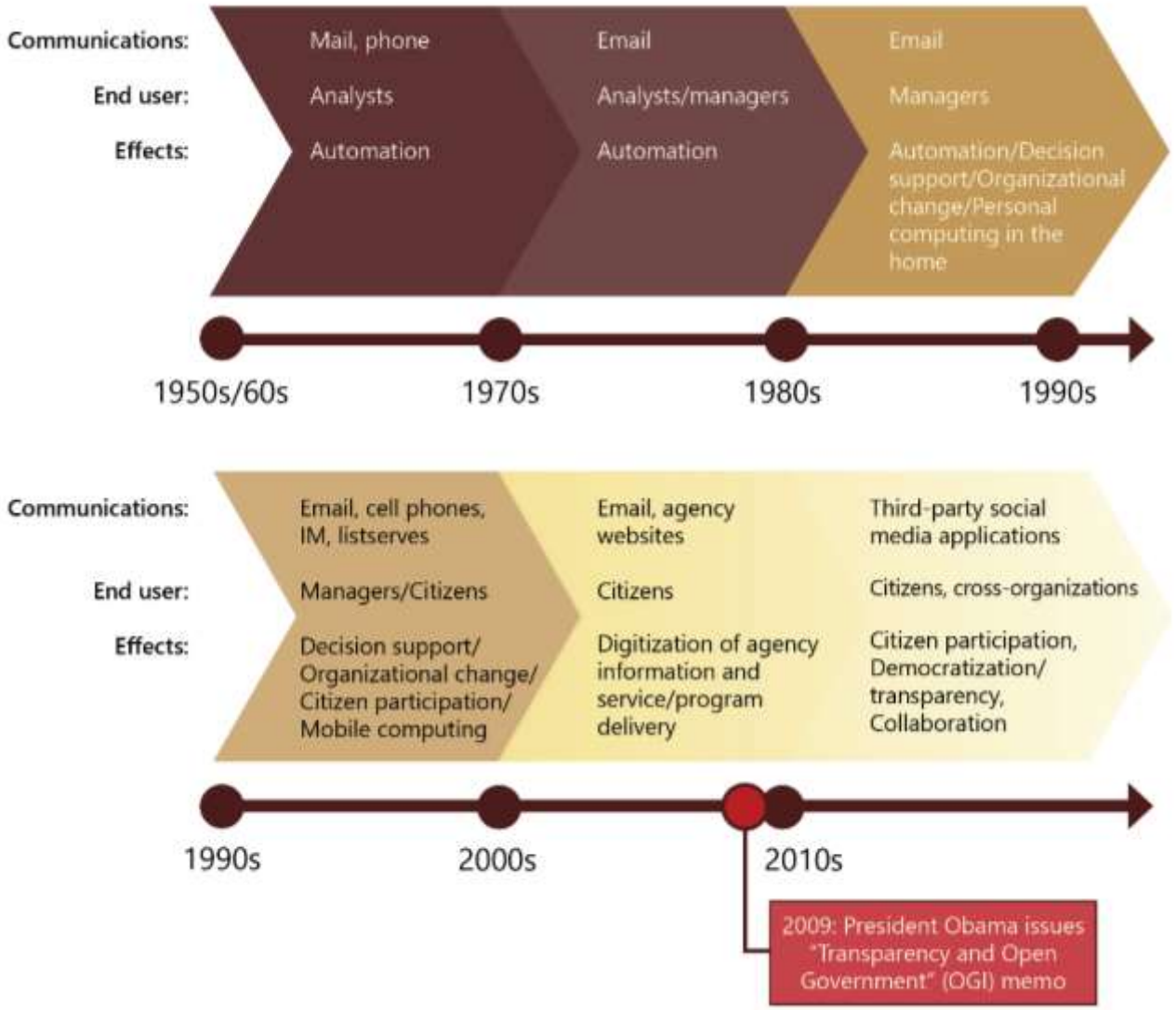


Figure 2. Historical Waves of E-Government, adapted by author from Mergel and Bretschneider (2011, 2012, 2013b)

2.3. YouTube's adoption and assessment as an educational tool by professionals in other fields

Chareen Snelson's 2011 paper "YouTube Across the Disciplines: A Review of the Literature" presents an overview of the state of scholarly literature related to YouTube. Snelson's research shows that from 2006-2009, the academic disciplines with the most publication activity for refereed journal articles and conference papers with "YouTube" in the title were

Communication, Journalism Media Studies, Education, and Health/Medicine, with Political Science and Information Technology close behind. Of the 188 publications Snelson observed, a total of 39 (or 20.7%) discussed teaching strategies or educational uses, indicating an early recognition by the academic community of YouTube's potential for education. Unsurprisingly, the majority of these publications YouTube came from researchers in the field of Education. However, with seven publications from the Health/Medical field on instructional methodologies, it seems that professionals and instructors in this field were early adopters of using YouTube for educational purposes. In addition, 13 publications from the Health/Medical academic discipline reported results of a research study involving YouTube in some way, such as studies of YouTube users or content.

YouTube has been studied and evaluated as a method for teaching clinical nursing skills (Kelly et al. 2009), a source of information on immunization (Keelan et al.2007), and its role has been examined in research communication across many academic disciplines (Kousha, Thelwall, Abdoli 2012). Across these many different disciplines and research questions, content analysis has been by far the most popular research design, and is the design I have chosen to employ in my research, as well. In her literature review, Snelson found "30 studies that used a basic content-analysis strategy" and posited that this "may be an indication that research methodologies for online video-sharing sites are not yet well defined or have not yet reached a level of sophistication that would permit more advanced approaches to video content analysis research" (Snelson 2011, 13). It appears that content analysis has proven a reliable, if somewhat simplistic, model for conducting early research on online videos.

Waters and Jones (2011), in their content analysis of the most viewed videos from the top 100 official nonprofit YouTube channels, had a team of researchers code videos for a number of

basic characteristics—such as views, rating, and length—as well as determine the primary purpose of each video. While my research focuses on city planning departments, and not nonprofit organizations, I drew heavily on the study's analytical methods in formulating my own research design. Using the four main purposes of nonprofit videos proposed by Pat Kardas in *Cheap Shots: Video Production for Nonprofits* (1993), "educate and inform the public about the mission and programs—services of the nonprofit, entertain the audience, increase the viewers' level of personal involvement with the organization, and inspire the audience to change the world" (Waters, Jones 2011, 254), Waters and Jones categorized the 100 analyzed videos by their primary purpose.

In addition to determining the purpose of each video, Waters' and Jones' research recorded to presence of specific presentation characteristics (e.g. title screens, captions, credits), branding elements (e.g. logo, web address, mission statement), the role of different on-camera speakers and organization representatives, the style of video used (i.e. professional vs. handheld video camera), and the level of interactivity or engagement with the posted videos, measured by characteristics such as number of viewer comments, the organization's response rate to comments, and the presence of an online or offline call to action (e.g. asking for feedback, providing information about volunteering opportunities, asking for donations). Through their research, Waters and Jones found that nonprofits primarily use their videos to inform and educate viewers about their missions, programs, and services, but that they do not take advantage of the medium's potential for engagement through direct appeals for involvement.

Another content analysis study, "Is Content Really King? An Objective Analysis of the Public's Response to Medical Videos on YouTube" (Desai et al. 2013), examined medical education YouTube videos published by credible healthcare organizations and evaluated the

educational breadth of these videos, their suitability, or "the degree to which the lay public could understand each video", and user engagement (Desai et al. 2013, 2). Educational breadth was a measure of the number of different medical topics covered by a given video, and user engagement was measured through the number of video views, likes, dislikes, favorites, and comments—elements which mirror the characteristics measured in Waters' and Jones' content analysis of nonprofit videos. Suitability evaluations were made using the Suitability Assessment of Materials (SAM) scoring system, which is used in the healthcare field to evaluate a wide range of patient education materials, including print, audio, and video formats. The factors evaluated through the SAM scoring system were: "1) content, 2) literacy demand, 3) graphics, 4) layout and typography, 5) learning stimulation, and 6) cultural appropriateness" (2). Though outside the scope of my research, SAM could provide a useful framework for future researchers evaluating the educational effectiveness of YouTube videos produced by city planning departments in the U.S. However, given that there currently exist very few academic publications within the urban planning field on the use of YouTube for educational purposes, an exploratory and qualitative research approach, such as content analysis, is both appropriate necessary at this time (Creswell 1994).

3. Research Design and Analytical Methods

Because this paper is exploratory in nature, I have chosen content analysis as the primary technique for examining both the YouTube channels and videos produced by major U.S. city planning departments. Before describing the content analysis performed, however, I will first explain my methods for choosing the cities, channels, and videos analyzed in this paper. To choose the cities I would study, I adapted the methods employed by Karen Mossberger and

Yonghong Wu in their research for "Civic Engagement and Local E-Government: Social Networking Comes of Age" (2012). Using the U.S. Census Bureau's population estimates for 2014, I chose the 30 largest cities by population. As Mossberger and Wu write, the larger local governments in these cities "are more likely to be first adopters of government innovations" and as such, a study of these cities takes "the pulse of those that could be expected to be at the forefront of new developments" (2012, 2).

After establishing this list of 30 cities, I then used two methods for discovering which of these cities' planning departments had YouTube channels. The first method was to visit each city's official website and search both the planning department's page and the city's general social media page (if available) for a link to the planning department's YouTube channel. For example, the City of Denver's Community Planning and Development webpage has links to the department's social media accounts near the top of the page, as seen in Figure 4 below. When clicked, the blue YouTube icon on the far right directs the user to the Community Planning and Development YouTube channel. Out of the top 30 cities, only four planning departments had YouTube channels that were linked directly from either the department's own webpage, or a citywide social media directory.

Figure 4. Screenshot from City of Denver Community Planning and Development webpage

To make sure I was not missing any planning departments' channels simply because they were not linked to their cities' websites, I used an additional discovery method. The second method was to use YouTube's "browse channels" search feature with a pre-determined set of keyword queries. For each city, I searched the non-case-sensitive terms "city of (city name) planning" and "(city name) planning department". In order to determine whether any of the search results were actually official, city government-affiliated channels, I used the following criteria as a guide:

1. If the name of the channel matched either the full name of the planning department or included an acronym consistent with the planning department's name, then I assumed the channel to be official;
2. If the channel's avatar was an image of the city's or department's logo or seal, then I assumed the channel to be official; or
3. If the channel's "About" section indicated that it was a government-affiliated channel, then I assumed the channel to be official.

For example, for the city of Houston, I first searched the term "city of houston planning". While this search yielded 65 channel results, none appeared to be officially affiliated with the City of Houston's Planning and Development Department, according to the criteria above. When I searched the term "houston planning department", the top result was a channel called "Houston Planning Department", and the avatar for this channel was the logo used by the City of Houston's Planning and Development Department on their own webpage. While the channel did not provide an "About" section, the name and avatar were enough to assume that this was the official YouTube channel for Houston's planning department. Using this second method, I found an additional four channels, which, combined with the channels found using the first method,

totaled eight planning department YouTube channels out of the 30 largest U.S. cities. Table 2 below shows the eight cities whose planning departments had YouTube channels at the time this research was conducted, in April 2016.

Table 2. Planning Department YouTube Channels

City	Population (2014)	Name of YouTube Channel
New York, NY	8,491,079	NYC Department of City Planning
Houston, TX	2,239,558	Houston Planning Department
San Francisco, CA	852,469	San Francisco Planning
Indianapolis, IN	848,788	Indianapolis Department of Metropolitan Development
Seattle, WA	668,342	Seattle DCI*
Denver, CO	663,862	DenverCPD
Boston, MA	655,884	BostonNeighbor
Portland, OR	619,369	Portland BPS

**NOTE: As of May 2, 2016 this channel's name was changed to* Seattle DCI *to reflect the department's name change. At the time this data was collected, the channel was named* seattledpd.

Author's analysis, 2016

While Table 2, above, is a comprehensive list of all official YouTube channels affiliated with planning departments from the 30 most populated U.S. cities, there are likely many more videos produced by these 30 cities' planning departments that are simply not published through planning department YouTube channels. The City of Phoenix, the City of Columbus, and the City of Austin, for example, all have citywide YouTube channels which include playlists dedicated to the cities' planning departments or planning-related news, but because the planning departments themselves do not host their own channels, for the purposes of this study, they were

left out of this analysis. These playlists were exempted, because when measuring their popularity, it is difficult to separate a playlist's number of views and subscriptions from those of the parent channel and other content published on that channel. Individual planning department YouTube channels, on the other hand, more accurately reflect subscription and viewership specifically connected to planning-related content. The *NYC Department of City Planning* channel was also left out of further analysis, as it did not have any uploaded content as of this study. In addition to the 30 largest cities in the U.S., I also looked at the 10 largest cities in Washington State by population, again following the research methods employed by Mossberger and Wu (2012). I found that, with the exception of Seattle, none of these Washington cities' planning departments had their own YouTube channels.

Once I had determined the complete list of city planning department YouTube channels to study, I recorded the following characteristics for each channel:

- Channel name
- Number of subscribers
- Number of views
- Total number of videos uploaded
- Date the first video was published
- Date the last video was published
- Channel age (The channel's "birth" date was assumed to be the date the first video was published. Every channel's age was calculated in months, as of April 16, 2016.)
- Name of the most popular video (by number of views)

As mentioned in the Introduction, viewership was used in this study as a measure of popularity, as it is currently the only video characteristic available for comparison across all

studied YouTube channels. Mergel (2013a) proposes a number of additional "mechanisms" for measuring social media usage as it pertains to the three missions of transparency, participation, and collaboration. The mechanisms specifically relevant to YouTube are summarized in Table 3 below. While Mergel (2013a) includes demographic data, ratings, click-throughs, and comments as potential metrics for interpreting social media interactions between citizens and their governments, none of these were feasible, or in some cases even available, for my study, for reasons which will be discussed in Findings. Additionally, a more in-depth discussion of the strengths and weaknesses of viewership as a proxy measurement for potential engagement is included in the Conclusions section.

Table 3. Adaptation of Innes Mergel's "A framework for interpreting social media interactions in the public sector" (2013a)

Mission	Goal	Social media mechanisms relevant to YouTube
Transparency: providing information for citizens about what their Government is doing	Information Education	• Views on YouTube • "Read more"
Participation: increasing opportunities to participate in policymaking and provide Government with the benefits of their collective expertise and information	Engagement	• Click-throughs from social media sites • Reach: demographic data (gender, location, cities) • Ratings on YouTube • Number of links & trackbacks
Collaboration: soliciting public feedback to assess and improve their level of collaboration and to identify new opportunities for cooperation	Cross-boundary	• Subscriptions to YouTube channel • Creating their own content • Comments or conversations • Volunteering, donations • Offline actions

I then cataloged each video upload from every channel and organized the collection of videos by popularity (i.e. number of views), from highest to lowest. When I compiled the list of all uploads, there were a total of 154 video uploads to seven separate city planning department

channels. For the sake of analyzing only original or specifically educational pre-recorded content, I decided to exclude from content analysis, but not from cataloguing, all public meeting recordings that were uploaded to these seven channels. Thirty-five meeting recordings were excluded from the pool of videos available for sampling, leaving a pool of 119 videos.

To select a sample of these 119 videos, I used a hybrid systematic-purposive sampling method with the intent to maximize the variation in content and popularity in the chosen sample. Starting at the top of the list, or the videos with the greatest number of views, I chose every fifth video to be included in the sample. In other words, I selected the first video, the sixth video, the eleventh video, and so on. In addition to this systematic sampling method, which produced a sample of 23 videos representing the population's entire range of viewership, I also identified each channel's most viewed video to be included in the sample, for a total sample size of 30 videos. In a few cases, I modified the systematic sampling method in order to include a wider range of videos for analysis.

When the systematic "select every fifth video" sampling rule produced multiple videos from the same channel and covering very similar content, I chose to replace that video with the next most popular video from the same five-video interval. For example, the *Seattle DCI* channel has 11 video uploads featuring exactly the same content, with the only difference being the videos' languages. The same video was translated from English into 10 different languages, in order to accommodate non-English-language-speakers. The English version was chosen automatically included in the sample, because it is the highest viewed video on that channel. The version of the video translated into Oromo was also chosen through the stratified sampling process, but because a video with the same content had already been included in the sample, and my inability to understand Oromo would have resulted in analysis limited to visual, non-text

elements anyway, I replaced this selection with the next most popular video from the same five-video interval. While these modifications to the sampling method admittedly insert my own bias into the final sample, given this paper's exploratory nature, a bias for content variety is preferable to the content redundancy resulting from a strict adherence to systematic precision.

Table 4 below shows the breakdown of videos included in the sample, according to the YouTube channel from which they were taken. As shown here, my methods purposefully over-sampled videos from channels with fewer uploads, such as *Houston Planning Department* and *DenverCPD*, in order to ensure comprehensive representation across all channels. *Seattle DCI* was significantly under-sampled, because 10 of the channel's 15 total uploads were foreign language versions of the same video, and so if these videos came up in the systematic sampling method, they were replaced by the next available video that would add to the diversity of the sample. The English-language version of this *Seattle DCI* video, "RRIO Inspection English", was included in the sample. Other than *Seattle DCI*, *PortlandBPS* and *San Francisco Planning* were the two other channels whose representation in the 30-video sample significantly deviated from their actual representation in the total population of videos (excluding meeting recordings). These discrepancies may be attributed to a combination of factors, including the small sample size of 30 and the irregular distribution of videos within the population that was sampled. For example, due to the method of ranking the population of videos by popularity before sampling, *San Francisco Planning* videos were clustered within the top 82 videos (out of a total of 119). Because of this clustering, *San Francisco Planning* videos tended to be over-sampled through the systematic sampling method. However, as I mentioned earlier, the intent behind my sampling method was not necessarily to mirror the channel representation found in the total population of

videos, but rather my bias was toward achieving a high degree of content variety in the final sample, which this method achieved.

Table 4. Number of Videos Sampled From Each Channel

Channel	Total Uploads	Percent of Total Population	Sampled Videos	Percent of Total Sample
PortlandBPS	46	38.7%	8	26.7%
San Francisco Planning	22	18.5%	8	26.7%
Seattle DCI	15	12.6%	2	6.7%
BostonNeighbor	12	10.1%	4	13.3%
Indianapolis Department of Metropolitan Development	11	9.2%	3	10.0%
Houston Planning Department	8	6.7%	3	10.0%
DenverCPD	5	4.2%	2	6.7%
TOTALS	**119**	**100%**	**30**	**100%**

Once the sample of videos was chosen, I recorded the following characteristics for each video:

Basic Video Characteristics

As with the channel observations, these characteristics were recorded before viewing the video by simply looking at the YouTube page for each video analyzed.

- Video name
- Channel on which the video is published
- Date published
- Number of views
- Duration

- Number of comments
- Number of "likes" and "dislikes"

Production Cost

I assigned each video to one of two production cost categories: High Production Cost and Low Production Cost. For the purposes of this categorization, "cost" should not be interpreted solely as monetary, rather it should be considered as a gauge of overall effort required to produce the studied video content and publish it to YouTube. This categorization is intended to distinguish between content that requires very little effort on the part of the planning department who publishes it, and content that requires a significant commitment of time and resources in order to produce and publish to YouTube. Recorded events, for example, require very little effort from planning departments in order to make them available on YouTube. Assuming the event itself is already being organized for a purpose other than being recorded and published on YouTube, planning departments can make this recorded content available to viewers for little to no production cost. Low Production Cost content is typically content that is opportunistically captured and posted to YouTube as a sort of second run channel, while High Production Cost content tends to be video that is planned in advance and produced with the express purpose of sharing on YouTube.

Another way to understand the distinction between Low Production Cost content and High Production Cost content is to situate the two within Mergel's and Bretschneider's "historical waves of e-government" (2011, 2012, 2013b). Figure 5 below shows how these two different content categories fit into this conceptual model.

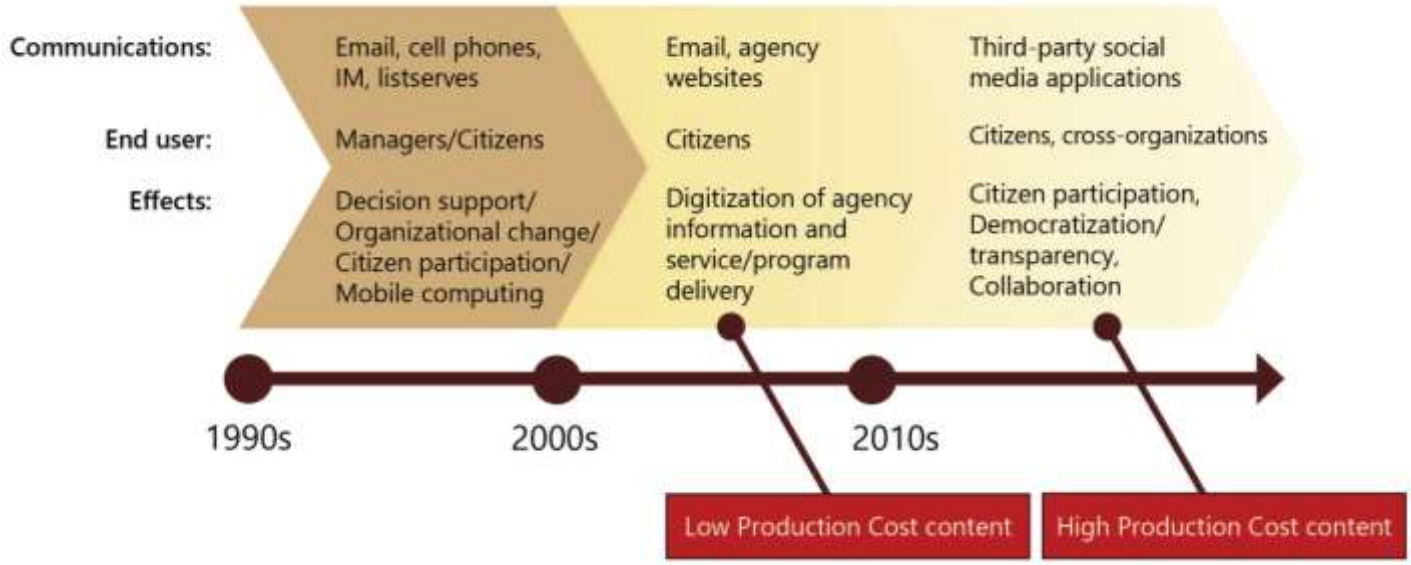


Figure 5. Contemporary Waves of E-Government and Production Cost, adapted by author from Mergel and Bretschneider (2011, 2012, 2013b)

Examples of Low Production Cost content

- Recorded events
    - Department or staff event
    - Educational event, such as Lunch & Learn, webinar, or keynote speech
- Still Images
    - PowerPoint presentation with voiceover
    - Photo slideshow
- Interview
    - With a local resident
    - With city staff
    - With elected official
    - With community leader

Examples of High Production Cost content

- "Explainer" video, in which a planning policy, program, or campaign is described with the intent to educate viewers
- Public service announcement, in which a message of public interest is disseminated with the intent to raise awareness about the issue and to perhaps change public behaviors or attitudes
- Video featuring an agency or project that models best planning practices or demonstrates successful results of a planning project or campaign

Production Quality

- Video quality – Did the video appear to be shot using a hand-held camera or a professional camera mounted on a rig? If hand-held, the video quality was recorded as "Amateur", if mounted on a rig, the video quality was recorded as "Professional".
- Overall editing/production quality – If closing credits indicated the video was produced professionally by a video production company, then the production quality was recorded as "Professional". If there were no closing credits, or the credits did not indicate whether the video was produced professionally, I used my knowledge of video editing and production to make a judgment. In general, if the video contained production elements that would require a professional-level editing software, such as Adobe's Premiere Pro or Apple's Final Cut Pro X, to achieve, I recorded the production quality as "Professional".

Production Elements

While watching each video, I documented the presence or absence of each of these production elements.

- Use of voiceover or off-camera speakers
- Use of on-camera speakers
- Use of motion graphics or animation
- Use of live action video
- Use of still images
- Use of background music

Engagement Elements

As with production elements, while watching each video I documented the presence or absence of the following public engagement elements:

- Explicit call to action or opportunities for further engagement – If the video provided, whether in the description or in the content of the video itself—ways for the viewer to learn more about the issue, invited viewers to share their ideas at an event or via some other form of communication (e.g. e-mail, phone call, online forum, etc.), or otherwise called on viewers to take an action, then I recorded the presence of this element, as well as the engagement tactic itself.
- Explicit reference to an ongoing planning project, program, or campaign – If the video explicitly referenced—whether in the title, description, or in the content of the video itself—an ongoing planning initiative, then I recorded a presence of this element. A "planning project, program, or campaign" was considered to be any named or branded initiative related to planning (e.g. Chinatown Broadway Street

Design Project, Houston Bike Plan, Comprehensive Plan 2035, Boston Shines, etc.). A planning project, program, or campaign was considered to be "ongoing" if either a) at the time the video was published, legislative action or other official approval was needed to codify or adopt the project, program, or campaign, or b) some other indication was made that the project, program, or campaign described was, at the time of video publication, currently underway and would continue to persist in the future (e.g. annually occurring initiatives). The intent of this metric was to distinguish between videos whose content, when taken on their own without the context of a City website or other explanation, was primarily educational, and those videos whose content was somehow linked to their planning departments' current (at the time of publication) efforts to engage citizens in a specific project, program, or campaign.

All channel observations were taken on April 16, 2016, and all video observations were taken on April 18, 2016.

4. Findings

I will discuss my findings below, and then I will draw conclusions from these findings, in order to address the two primary research purposes and their secondary questions:

1. Illustrate that U.S. city planning departments are behind other fields and professions when it comes to adopting YouTube as an educational tool.
    a. Across academic and professional disciplines, what is the state of published literature relating to YouTube's use as an educational tool? (See Literature Review subheading: *YouTube's adoption and assessment as an educational tool by professionals in other fields*)

b. Of the 30 most-populated U.S. cities, which planning departments have YouTube channels? How does the number of planning department YouTube channels compare to the number of citywide or other city department YouTube channels?

2. Describe the nature and quality of digital video content shared through U.S. planning departments' YouTube channels.
    a. What are the basic characteristics of the studied YouTube channels? How do these characteristics differ between the most and least popular channels?
    b. What types of content are present on these planning departments' YouTube channels? What types of content are present in the most/least popular videos published on these channels?
    c. What production elements and production quality are present in these planning departments' YouTube channels? What production elements and production quality are present in the most/least popular videos published on these channels?
    d. What engagement elements are present in these planning departments' YouTube channels? What engagement elements are present in the most/least popular videos published on these channels?

4.1. Research Question 1b

Of the 30 most-populated U.S. cities, which planning departments have YouTube channels? How does the number of planning department YouTube channels compare to the number of citywide or other city department YouTube channels?

As mentioned above, of the top 30 largest cities in the United States by population, only eight city planning departments have YouTube channels. As of April 16, 2016, a total of 154 video uploads were made to these seven channels, with the number of video uploads per channel

ranging from zero (*NYC Department of City Planning*) to 100 (*Portland BPS*). San Francisco (*San Francisco Planning*) was the first to upload a video to their channel on October 5, 2009, and Indianapolis (*Indianapolis Department of Metropolitan Development*), with the newest channel, uploaded its first video on December 8, 2015. For comparison, of the 30 cities studied, all but two (San Jose and Memphis) had at least one official YouTube channel associated with the city government, and all but three (Charlotte, El Paso, and Oklahoma City) had at least one official YouTube channel associated with the city's police department.

Police departments were chosen as a point of comparison, because many studies have been done related to police departments' use of social media, given their relatively early and diverse adoption of these technologies, compared to other government agencies (Brainard 2016, 119). Given that this sample of the 30 largest cities in the U.S. presumably represents the planning departments most likely to be first adopters of innovative communication technologies, it seems that planning departments are well behind their own city governments, in general, and police departments, specifically, when it comes to using YouTube as a tool for public communication and education. Table 5 below shows the 30 cities studied, arranged from largest to smallest by population, and indicates whether the city had a citywide or mayoral YouTube channel, a police department channel, and/or a planning department channel as of April 16, 2016. The grey boxes highlight cities that do not have an official citywide/mayoral, police department, or planning department YouTube channel. Figure 6 summarizes the data found in Table 5, illustrating the large disparity between the number of YouTube channels for planning departments and those created for police departments or general city usage.

Table 5. YouTube Channels of 30 Most Populated U.S. Cities

City	Population (2014)	Citywide or Mayoral YouTube Channel?	Police Department YouTube Channel?	Planning Department YouTube Channel?
New York	8,491,079	Yes	Yes	Yes
Los Angeles	3,928,864	Yes	Yes	No
Chicago	2,722,389	Yes	Yes	No
Houston	2,239,558	Yes	Yes	Yes
Philadelphia	1,560,297	Yes	Yes	No
Phoenix	1,537,058	Yes	Yes	No
San Antonio	1,436,697	Yes	Yes	No
San Diego	1,381,069	Yes	Yes	No
Dallas	1,281,047	Yes	Yes	No
San Jose	1,015,785	No	Yes	No
Austin	912,791	Yes	Yes	No
Jacksonville	853,382	Yes	Yes	No
San Francisco	852,469	Yes	Yes	Yes
Indianapolis	848,788	Yes	Yes	Yes
Columbus	835,957	Yes	Yes	No
Fort Worth	812,238	Yes	Yes	No
Charlotte	809,958	Yes	No	No
Detroit	680,250	Yes	Yes	No
El Paso	679,036	Yes	No	No
Seattle	668,342	Yes	Yes	Yes

Denver	663,862	Yes	Yes	Yes
Washington	658,893	Yes	Yes	No
Memphis	656,861	No	Yes	No
Boston	655,884	Yes	Yes	Yes
Nashville	644,014	Yes	Yes	No
Baltimore	622,793	Yes	Yes	No
Oklahoma City	620,602	Yes	No	No
Portland	619,360	Yes	Yes	Yes
Las Vegas	613,599	Yes	Yes	No
Louisville	612,780	Yes	Yes	No

Author's analysis, 2016

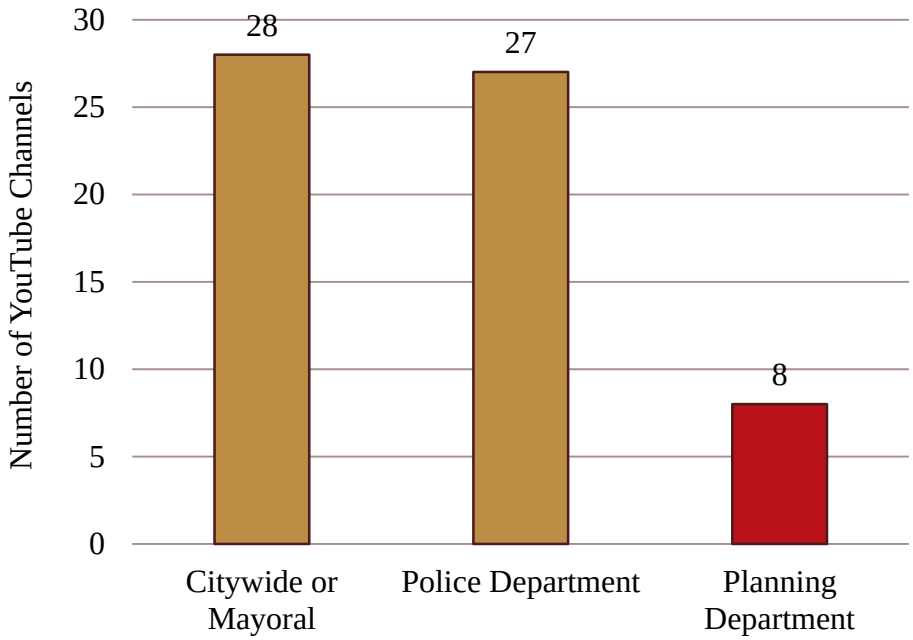


Figure 6. Summary of YouTube Channels of the 30 Most Populated U.S. Cities

4.2. Research Question 2a

What are the basic characteristics of the studied YouTube channels? How do these characteristics differ between the most and least popular channels?

Table 6 below shows the list of all eight planning department YouTube channels from the 30 largest U.S. cities, in order of most populated to least. The dark red-brown color indicates the smallest data point for select metrics, and the red indicates the highest data point. The intent behind collecting data on dates of video publishing, channel age, and total and average number of uploads was to determine how active each of these YouTube channels were, as of April 16, 2016. Figure 7 illustrates the dates of first video published for each channel on a timeline.

NYC Department of City Planning, for example, did not have any videos uploaded to it, and as such is considered inactive and will not be included in subsequent tables. *Indianapolis Department of Metropolitan Development* is the newest channel (four months old at the time the data was collected), and with 11 total uploads has the highest average number of uploads per month, calculated by dividing "Total Number of Uploads" by "Channel Age (in months". *San Francisco Planning* is the oldest channel, having uploaded its first video on October 5, 2009. *Portland BPS* has by far the greatest number of total uploads at 79, due in part to its regular posting of Planning and Sustainability Commission meetings to this channel. The other planning department channels do not post their commission meetings to their YouTube channels on a regular basis, if at all, opting instead to post these recordings to a citywide YouTube channel or to a different website altogether. Not counting its meeting recordings, however, Portland BPS still has the largest number of uploads at 46.

Table 6. Planning Department YouTube Channel Activity and Promotion

YouTube Channel	Date First Video Published	Date Last Video Published	Channel Age (in Months)	Total Number of Uploads	Average Number of Uploads per Month	Linked from Citywide Social Media Directory?	Linked from Planning Department's Webpage?
San Francisco Planning	5-Oct-09	15-Dec-15	78	22	0.28	Yes	Yes
BostonNeighbor	24-May-10	15-May-15	71	12	0.17	Yes	Yes
Portland BPS	22-Sep-10	12-Apr-16	67	79	1.18	Yes	No
Seattle DCI	7-Dec-11	21-Oct-15	52	15	0.29	No social media directory	No
DenverCPD	30-Apr-13	27-Oct-14	36	5	0.14	No social media directory	Yes
Houston Planning Department	25-Feb-14	14-Apr-16	26	10	0.38	No	No
Indianapolis Department of Metropolitan Development	8-Dec-15	24-Mar-16	4	11	2.75	No	No social media links shared on department's webpage
NYC Department of City Planning	Not Applicable	Not Applicable	Not Applicable	0	0	No	No

Author's analysis, 2016

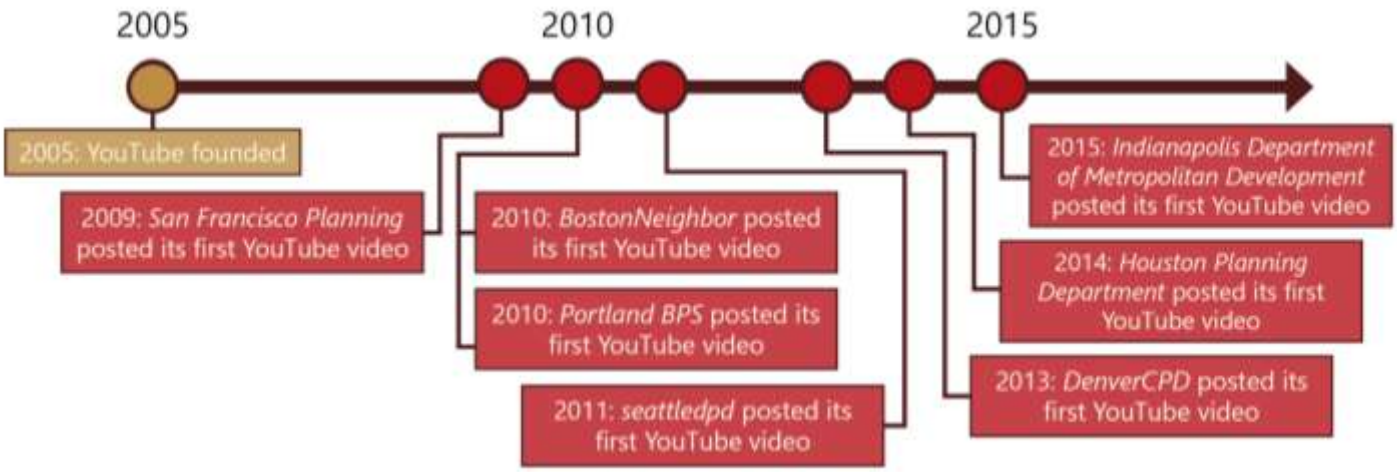


Figure 7. Summary of First Video Postings of Studied Planning Department YouTube Channels

The last column of Table 6, noting whether or not the YouTube channel was linked from the city's website, is an indicator of the extent to which the city or planning department actively promotes the channel. Six of the eight cities' websites have central social media directories, where users can browse social media accounts across all city departments in one place. In the case of Seattle and Denver, these cities' websites do not have social media directories listing all official accounts in one place. Instead, these cities' websites include links to social media accounts directly from each department's homepage. Portland promotes its planning department's YouTube channel through a link in their citywide social media directory, Denver does so through a link on the planning department's own webpage, and San Francisco and Boston do so through both. Conversely, New York, Houston, Indianapolis, and Seattle do not promote their planning departments' YouTube channels at all through the cities' websites.

In the case of New York, we may assume that the city's choice not to promote *NYC Department of City Planning* is due to the channel's lack of content. In the case of the other three cities, we may infer from the lack of promotion that these planning departments' YouTube

channels are not a primary medium for communication, and that more traditional outreach tactics or other social media platforms are preferred and used more often. These planning departments may use their YouTube channels as places to host videos to be shared—as a link or through an embedded video player—on other online channels, such as the City's website or the department's Facebook page, rather than trying to draw traffic to the channel itself.

For the purposes of this study, a channel's number of subscribers and number of views are considered measures of its popularity. For individual videos, number of views was the only available measure of popularity, for reasons which will be discussed later. "Number of Subscribers" in Table 4 below indicates how many YouTube users have chosen to follow that channel and receive notifications any time new videos are uploaded to that channel. This number is the best measure for how many YouTube users have actively expressed interest in seeing most or all of the video content produced by each of these planning departments. Table 4 also shows each channel's "Average Number of Subscribers per 100,000 People", based on the city's U.S. Census Bureau population estimates from 2014. This measurement takes into account the wide range of city sizes from Houston (pop. 2,239,558) to Portland (pop. 619,360) and assumes that all of the subscribers are residents of the cities to whose YouTube channels they subscribed. By this measure, *Portland BPS* (16.15 subscribers per 100,000 people) is the most subscribed planning department channel, with *San Francisco Planning* (16.07 subscribers per 100,000 people) close behind. While users must sign into a YouTube account in order to subscribe to a channel, anyone—with or without a YouTube account—may view a video. No matter the viewing platform (e.g. directly on YouTube, embedded on the city's website, linked from Facebook, etc.), each time the video is played for a certain duration (varies, depending on the total length of the video), a view will be recorded on YouTube. "Total Number of Views" simply

indicates the sum of views for all videos on a given channel. "Average Number of Views per Upload" and "Average Number of Views per Month" are the "Total Number of Views" divided by the "Total Number of Uploads" and "Channel Age (in months)" from Table 7 respectively. As with the subscriber metrics, San Francisco and Portland both hold the top two spots for total and average viewership, per upload and per month.

Table 7. Planning Department Channel Popularity

Name of YouTube Channel	City Population[1]	Total Number of Subscribers	Average Number of Subscribers per 100,000 People	Total Number of Views	Average Number of Views per Video	Average Number of Views per Month
Houston Planning Department	2,239,558	9	0.40	2,133	213	82
San Francisco Planning	852,469	137	16.07	23,732	1,079	321
Indianapolis Department of Metropolitan Development	848,788	5	0.59	276	25	92
Seattle DCI	668,342	3	0.45	803	54	17
DenverCPD	663,862	4	0.60	4,544	909	252
BostonNeighbor	655,884	21	3.20	1,306	109	22
Portland BPS	619,360	100	16.15	40,874	517	610

[1] U.S. Census Bureau 2014 Author's analysis, 2016

After cataloging all seven channels' videos (154 total) and putting them in order from highest to lowest number of views, I assigned the first 51 videos to "Popularity Tier One", the next 52 videos to "Popularity Tier Two", and the next 51 videos to "Popularity Tier Three". Because 154 is not evenly divisible by three, one tier would need to have 52 videos, while the other two had 51. I chose to make the first and third tiers both have 51 videos, as I wanted the top one-third most popular videos (Popularity Tier One) to be directly comparable to the bottom one-third least popular videos (Popularity Tier Three). Table 7 shows how all 154 videos were

divided into three Popularity Tiers, and notes the number of meeting recordings in each tier. I averaged the video lengths in each of these tiers, and the results showed that Tier Three videos are, on average, about 15 minutes longer than Tier One videos. Using the same methods as before, but excluding meeting recordings for a total sample of 119 videos, I found that Tier Three videos, again, are approximately 15 minutes longer, on average, than Tier One videos (Table 8).

YouTube categorizes videos as ”Short” if they are less than four minutes long and “Long” if they are over 20 minutes in length. As Tables 8 and 9 show, long videos tend to be less popular than short ones, demonstrating that, in terms of video length, trends in the popularity of videos published by city planning departments mirror those of other content published on YouTube (Feroz Khan) (Pew Research Center: Journalism & Media Staff).

Table 8. Video Duration and Popularity, 154 Video Sample (including meeting recordings)

Video Popularity Tiers	Number of Meeting Recordings	Total Number of Videos	Average Video Duration (hours: minutes: seconds)	Total Number of Views	Average Number of Views per Video
Tier One: Videos 1-51	1	51	00:07:14	63,108	1,237
Tier Two: Videos 52-103	22	52	00:10:28	6,281	121
Tier Three: Videos 104-154	12	51	00:22:17	2,121	42
TOTALS & AVERAGES	**35**	**154**	**00:16:49**	**71,510**	**464**

Author’s analysis, 2016

Table 9. Video Duration and Popularity, 119 Video Sample (excluding meeting recordings)

Video Popularity Tiers	Number of Short Videos (under 4 minutes)	Number of Videos with Durations of 4 to 20 Minutes	Number of Long Videos (over 20 minutes)	Total Number of Videos	Average Video Duration (hours: minutes: seconds)	Total Number of Views	Average Number of Views per Video
Tier One: Videos 1-40	29	8	3	40	00:04:13	60,815	1,520
Tier Two: Videos 41-79	26	10	3	39	00:07:07	5,536	142
Tier Three: Videos 80-119	16	10	14	40	00:19:03	1,532	38
TOTALS & AVERAGES	**71**	**28**	**20**	**119**	**00:10:09**	**67,883**	**570**

Author's analysis, 2016

Using the hybrid systematic-purposive sampling method described in the Research Design and Analytical Methods section, I selected a 30 video sample from the seven studied YouTube channels. I watched each video, noted the aforementioned measurements for Basic Video Characteristics, Production Cost, Production Quality, Production Elements, and Engagement Elements, and wrote a brief description of the content. "Number of Views" was used as the primary measure of video popularity, given its availability for every video. Though YouTube has built-in features allowing viewers to rate videos and write comments in response to videos, these features were either disabled by the planning departments' channel administrators, or they only rarely used by viewers. For example, only six of the 30 videos sampled had been rated by users through YouTube's "Like" and "Dislike" feature, and only one video ("SF PLANNING: Housing") had any user comments. In addition, *PortlandBPS* and *Denver CPD* both disabled viewer comments and ratings, leaving view counts as the only popularity metric available across all seven studied channels.

4.3. Research Question 2b

What production costs are reflected in the video content published on these planning departments' YouTube channels? Is there a relationship between video production cost and video popularity?

As Table 10 shows, High Production Cost videos were more popular, in terms of number of views, than Low Production Cost videos. While I placed the videos falling into the Low Production Cost category into their own sub-categories, I did not do so with the High Production Cost videos. I made the decision not to sub-categorize the High Production Cost videos, because the content and formats presented within this production cost category were much more varied than those in the Low Production Cost category. Any attempt to sub-categorize the High Production Cost content would have either resulted in a large number of very specific, but rather useless sub-categories, or a smaller number of overly-generalized and similarly useless sub-categories. In lieu of providing sub-categories for the High Production Cost content, I invite the reader to view my narrative descriptions of each of the videos in the Appendix.

Table 10. Production Cost and Video Popularity

Production Cost*	Number of Videos	Total Number of Views	Average Number of Views
Low Production Cost (TOTAL)	17	2,713	528
Recorded event	8	615	77
Still images	5	1,474	295
Interview	4	624	156
High Production Cost	13	28,760	2,212
TOTAL	**30**	**31,473**	**1,049**

**NOTE: "Cost" in this sense does not refer solely to monetary cost, but rather to the overall time and resource commitment required to produce and publish this content to YouTube.*

Author's analysis, 2016

4.4. Research Question 2c

What production elements and production quality are present in these planning departments' YouTube channels? What production elements and production quality are present in the most/least popular videos published on these channels?

My observations about video and production quality, as well as select production elements, in the 30 videos sampled for content analysis are summarized in Tables 10-12. As Table 11 shows, half of the analyzed videos were considered to be of professional quality, and half were considered to be not of professional quality. While the videos were split evenly in terms of production quality, professional quality videos garnered, on average, 1,751 more views than videos not of professional quality. This finding supports other studies of online news videos that found "viewers reject poor-quality news videos" and will view an "organization that produces low-quality work less highly and be less likely to visit or recommend its site" (Chen 221).

Table 11. Production Quality and Video Popularity

Video and Production Quality	Number of Videos	Total Number of Views	Average Number of Views
Professional	15	28,869	1,925
Not Professional	15	2,604	174
TOTALS & AVERAGES	**30**	**31,473**	**1,049**

Author's analysis, 2016

When it comes to the number and type of production elements that make these planning departments' YouTube videos more popular, the findings are not as clear-cut as those for production quality. Table 12 shows the number of videos featuring each production element, as

well as the popularity of these videos. Based on this sample of 30 videos, it would appear that, of the six elements observed, the presence of motion graphics or animation coincides with the highest average views per video. This observation helps explain one apparent outlier in Table 12 and Figure 8.

DenverCPD's "Denver Zoning Code" video is one of the two videos featuring only one observed production element. This video is the most-watched video on the *DenverCPD* channel and features only motion graphics. The video has no audio whatsoever, the graphics include minimal text and relatively simple illustrations of different building types and land uses, and at 51 seconds, "Denver Zoning Code" is tied for the fourth-shortest video of the 30 video sample. While this video looks very simple, and in some ways even incomplete, the attractive visual style and motion graphics seem to have made it the seventh most popular video out of the 30 video sample, with 3,238 views as of April 18, 2016. In fact, "Denver Zoning Code" is the only video in the top ten most popular videos that was not published by either *San Francisco Planning* or *PortlandBPS*, by far the two most popular planning department channels studied. Disregarding the "Denver Zoning Code" outlier, it appears that videos featuring five or six different production elements tend to be more popular than those featuring fewer than five.

Table 12. Production Elements and Video Popularity

Production Elements	Number of Videos	Total Number of Views	Average Number of Views per Video
Voiceover or Off-Camera Speaker	14	24,738	1,767
On-Camera Speakers	19	14,205	748
Motion Graphics or Animation	9	27,201	3,022
Live Action	19	26,540	1,397
Still Images	21	23,037	1,097
Background Music	12	26,180	2,182

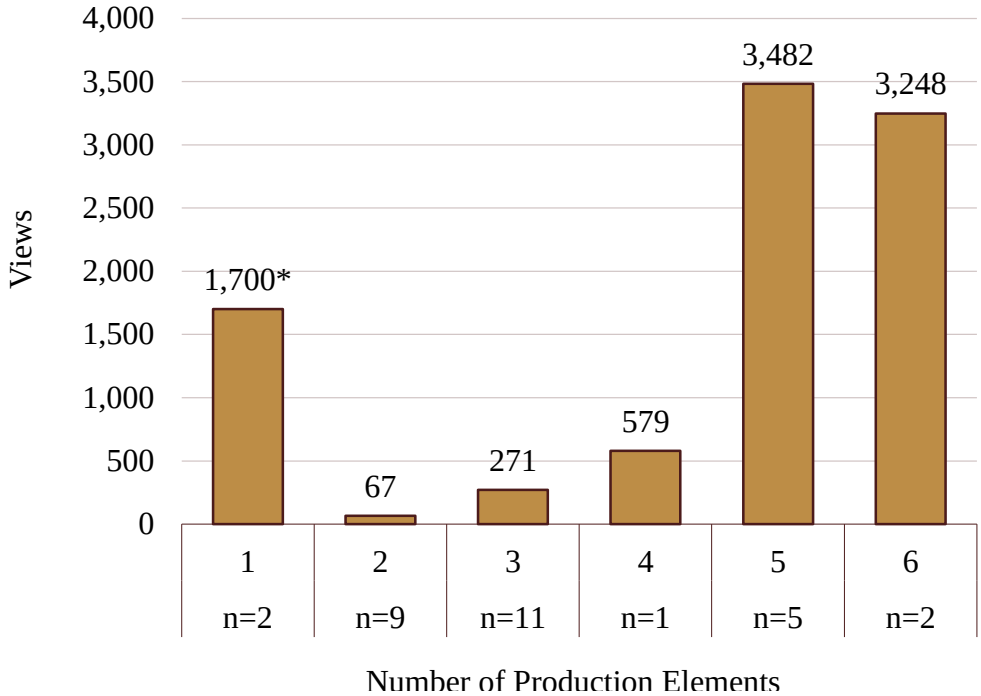
Author's analysis, 2016

Table 13. Total Number of Production Elements and Video Popularity

Number of Production Elements	Number of Videos	Total Number of Views	Average Number of Views
1	2	3,399*	1,700*
2	9	604	67
3	11	2,986	271
4	1	579	579
5	5	17,410	3,482
6	2	6,495	3,248
TOTALS & AVERAGES	**30**	**31,473**	**1,049**

**NOTE: These numbers are affected by the "Denver Zoning Code" outlier video. See page 41 for a detailed description of this outlier and its effects on the dataset.*

Author's analysis, 2016



**NOTE: These numbers are affected by the "Denver Zoning Code" outlier video. See page 41 for a detailed description of this outlier and its effects on the dataset.*

Figure 8. Total Number of Production Elements and Video Popularity

4.5. Research Question 2d

What engagement elements are present in these planning departments' YouTube channels? What engagement elements are present in the most/least popular videos published on these channels?

The last set of elements I studied were those intended to encourage viewers to take action or get more involved in a particular local planning initiative. Table 14 and Figure 9 below summarize these findings, which seem to indicate that videos featuring either an explicit call to action (e.g. "Visit our website to learn more", "Take this survey to share your feedback", etc.), an explicit reference to an ongoing local planning initiative (e.g. comprehensive plan update, neighborhood rezoning, etc.) or both, tend to garner more views than those that do not feature either.

Examples of explicit and not explicit (general education about a policy or set of policies, e.g. context-based zoning. While this video may have been released as part of Denver's update of their zoning code, because there is no explicit reference to the update in the video description, title, or the video content itself, this video was classified as having no explicit reference to an ongoing planning project, program, or campaign. San Francisco's Planning's video "San Francisco's Affordable Housing Bonus Program: An Overview", however, was coded as containing an explicit reference to an ongoing planning program.

Table 14. Engagement Elements and Video Popularity

Engagement Elements	Number of Videos	Total Number of Views	Average Number of Views
Explicit call to action	16	22,300	1,394
No explicit call to action	14	9,173	655
Explicit reference to an ongoing planning initiative or policy	21	27,415	1,305
No explicit reference to an ongoing planning initiative or policy	9	4,058	451
Explicit call to action AND reference to an ongoing planning initiative or policy	12	21,852	1,821
NEITHER explicit call to action NOR reference to an ongoing planning initiative or policy	5	3,610*	722*

**NOTE: These numbers are affected by the "Denver Zoning Code" outlier video. See page 41 for a detailed description of this outlier and its effects on the dataset.*

Author's analysis, 2016

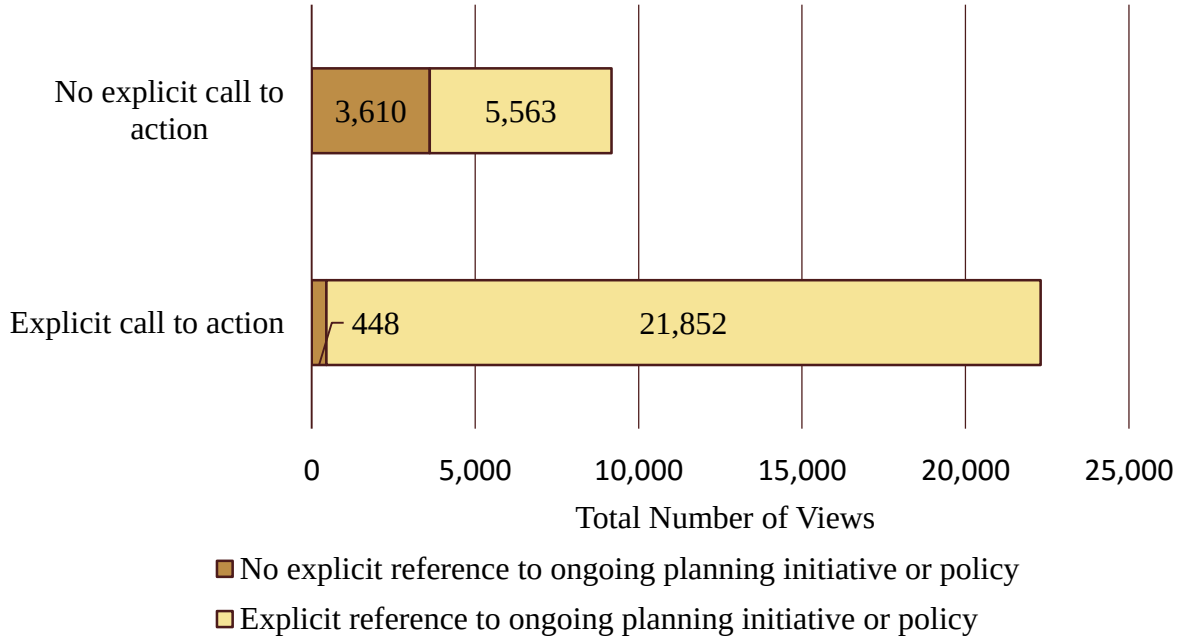


Figure 9. Engagement Elements and Video Popularity

5. Conclusions

By creating educational video content and publishing it to a YouTube channel, city planning departments may be able to more effectively engage citizens in public planning processes. Many researchers in academia and professionals in the medical and other STEM fields have recognized YouTube as a dynamic medium for educating students, as well as the general public. Planning departments in the United States' largest cities, on the other hand, are well behind STEM communicators and instructors, classroom teachers, medical professionals, and police departments when it comes to taking advantage of YouTube's educational potential.

While in comparison to other professional and academic fields, planners may be considered rather late adopters of YouTube, in the context of the planning profession, the planning departments studied are among its pioneers. Because this study looked only at the

planning department channels available for the top 30 most-populated U.S. cities, readers should be cautious about generalizing these findings to all planning departments. Further, given the rather small sample size of 30 videos taken from seven channels, these conclusions provide a somewhat narrow picture of the potential for planning departments to produce educational content that encourages citizens to get more involved in planning initiatives. That said, the intent of this study was to explore and describe the current use of YouTube by planning departments for educational and engagement purposes, in order to pave the way for future use by other planning departments, as well as to illuminate further areas for future research.

Based on my findings from studying the YouTube channels of seven major U.S. cities' planning departments, I noticed the following patterns in these channels' most viewed videos:

1. Video length: In general, shorter videos (less than four minutes in duration) tend to be more popular than longer videos (over 20 minutes in duration). This finding matches existing literature and generally-accepted best practices around using YouTube as an educational tool, indicating that, at least in this regard, planning department-produced content is similar to other content published on YouTube.
2. Production cost: Videos that require low production effort (or cost), such as recorded events or image slideshows, tend to garner a very small number of views, while videos featuring content that requires high production effort tend to garner a greater number of views. This apparent viewer preference for higher production cost content may signal the need for a shift in the way planning departments approach time- and resource-allocation for YouTube (or other social media) content production. In other words, if planning departments want to take full advantage of the educational and engagement potential afforded by YouTube, they may need to prioritize the creation

of content exclusively for YouTube, rather than attempt to engage viewers through second-hand content.

3. Production quality: Echoing the aforementioned findings about production cost, videos that appear to be professionally shot and edited tend to gain more views than videos with non-professional production quality.
4. Production elements: Videos that contain a combination of multiple elements, such as voiceovers, motion graphics or animation, live action, or background music, tend to get more views than videos that include only one or two of these elements. Despite this tendency, as the "Denver Zoning Code" video demonstrates, content featuring only one of these elements (in this case, motion graphics) still has the potential to garner hundreds, or even thousands of views.
5. Viewer engagement: Videos with specific calls to action and references to ongoing planning projects, programs, or campaigns tend to gain more views than videos without either of these engagement elements. In addition, there is great potential for deeper viewer engagement through YouTube's comment and rating features, but most of the planning department channels studied have either disabled this feature or do not encourage viewers to use it.

5.1. Drawbacks of Using Viewership to Measure Engagement

Kleinhans et al. wrote that "several conditions must be met" in order to take advantage of the "clear engaging potential of social media, online platforms and mobile technologies" (2015, 238). These conditions include:

- Connecting virtual engagement to concrete actions in the physical world;
- Engaging the public through a range of online and offline tools; and

- Ensuring that voices of dissent are not marginalized, in favor of more powerful interests, such as those of private developers.

While my study shows that the most popular planning department YouTube channels and videos tend to be those that address the first two conditions proposed by Kleinhans et. al. (2015), it falls short of actually measuring the engagement outcomes related to these conditions. By measuring number of views, this study highlights the *potential* engagement of thousands of viewers of popular YouTube videos published by planning departments, but as discussed before, education and engagement outcomes in the form of informed participation in planning processes do not automatically follow viewership. Viewership is instead a proxy variable that more closely tracks public exposure to videos with educational or engagement-driven content, rather than a measurement of educational or engagement outcomes, themselves. In addition, counting a video's number of views is not the same as counting a video's number of unique viewers. One viewer may watch a video multiple times, or multiple viewers may watch a video a single time, but YouTube's view count does not provide this distinction.

Similarly, due to YouTube's algorithms for determining the threshold for view duration that "counts" as a view, shorter videos may have higher view counts than longer videos, though the longer videos may have greater aggregate viewership time. Therefore, a more instructive variable may be instead Average View Duration, a measurement captured through YouTube's "Video statistics" feature, which takes into account the average amount of time viewers spent watching a given video. This measurement, particularly when expressed as a percentage of the video's actual length, more accurately reflects viewer exposure to video content, and thus better expresses the video's engagement potential. For example, a five minute video with an Average View Duration of 4:45 (or 95% of the actual video length) may have a smaller view count than a

two minute video with an Average View Duration of 30 seconds (or just 25% of the actual video length), but because viewers are actually watching a greater percentage of the five minute video, they are exposing themselves to more of its educational content, thus increasing the video's potential for post-view engagement. When uploading a video, channel administrators have the option to make additional statistics, such as Average View duration publicly available, and for the purposes of future research, these measurements may provide valuable insights into actual viewer engagement outcomes over time.

5.2. Directions for Future Research

This challenge of matching available engagement metrics to actual engagement outcomes is not unique to this study. In "A framework for interpreting social media interactions in the public sector", Ines Mergel wrote:

> "Social media directors face the ambiguous situation in which only rudimentary measurement techniques are provided by third-party service providers and officially approved measurement dashboards are either not available or not affordable [….] Future research is needed to design and test social media metrics on a large scale quantitative basis and compare the data with agency missions and social media strategies" (Mergel 2013, 333)

Fortunately, this work is already being undertaken by researchers in the field of public affairs. Pamela S. Medina at the University of Colorado Denver and Thomas A. Bryer at the University of Central Florida are exploring new methods for assessing social media sites' effectiveness at promoting citizen engagement. Their ongoing research is a valuable step toward developing a more sophisticated evaluation of the educational effectiveness of planning

departments' YouTube content. While their research focuses on Facebook as the primary platform of study, Medina's and Bryer's recommendations to integrate citizen engagement outcome and quality measures into assessments of governments' social media usage should be applied to all platforms, including YouTube.

As for the third condition identified by Kleinhans et al. (2015), ensuring that voices of dissent are not marginalized in favor of more powerful interests, this is an especially weighty consideration given the third-party ownership of YouTube and most other social media sites. Questions about citizen privacy and privatization of government information and assets must be addressed as city planning departments move from a "decentralized, informal experimentation" phase into "institutionalization and consolidation" of YouTube and other social media policies and practices (Mergel 2013).

As more planning departments across the U.S. begin to create their own YouTube channels and existing channels expand their content offerings, stronger associations between video popularity and the production and engagement characteristics analyzed in this study may emerge. In addition, as methods are developed to measure effective social media education and engagement outcomes, rather than just education and engagement potential, the literature around planning departments' use of YouTube should expand to include more quantitative and experimental methods. With these themes in mind, I would like to propose the following areas for future research:

- Survey viewers of planning departments' YouTube videos to better understand the demographics of viewers, the type of content they find most helpful and interesting, and how effective the videos are at actually initiating viewer engagement. Viewers may be asked to complete a pre-test survey to gauge their knowledge of a specific planning topic

before watching a YouTube video about that topic. After they have viewed the video, they could then be tested on whether or not their knowledge of the topic has increased. Additionally, tracking click-throughs from YouTube videos to more information about the topic or online/offline actions may be one way to being to measure increased engagement in the issue.

- Study city governments' openness to YouTube comments and their responsiveness when viewers ask questions or start discussions in that forum. How does this impact the volume, type, and quality of comments received? Viewer comments themselves may also provide a measure for gauging educational or engagement outcomes of YouTube videos. Comments could be assessed based on their relevance and accuracy regarding the planning issue presented in the video. Higher quality comments, that is, those that are more relevant and accurate, could signal positive engagement with the educational content. That said, the anonymity of the YouTube comment forum and the platform's third-party ownership has, to this point, made measuring these types of outcomes a challenge.

5.3. YouTube as a Tool to Connect Youth with Planning Issues

As mentioned in the Introduction, the original intent of this paper was to explore the effectiveness of using YouTube as a means to educate and engage young people in urban planning issues. While the data necessary to complete such an analysis is not currently available, YouTube's potential for enhancing planning departments' youth engagement efforts is an area of study ripe for future research. People ages 18-34 years old, sometimes referred to as Digital Natives or Millennials, make up nearly one-quarter (23.4%) of the total U.S. population, and in major cities that percentage tends to be even higher (U.S. Census 2014a). YouTube reaches more

18-34 year-olds than any cable network in the U.S. ("Statistics" n.d.), and in a survey conducted by the Associated Press-NORC Center for Public Affairs Research, researchers found that 83 percent of Millennials get news from YouTube at least occasionally, putting it behind only Facebook (88 percent) as the most popular social media platform for news and information ("How Millennials Get News" 2015, 25). In that same survey, when asked about where they go for information about their city, town, or neighborhood, 77 percent of Millennials stated that they used a social media platform ("How Millennials Get News" 2015, 16). And while concerns about a digital divide, in which people of color and individuals earning low incomes might be marginalized when it comes to technology use, were prevalent early on in governments' adoption of social media and other online tools, there is a "growing body of evidence that the digital divide has not materialized as expected" and that "African American and Hispanic American adults have come to rely on a variety of technologies and devices to get their news today, and in rates similar to adults in the United States generally" ("The Personal News Cycle" 2014, 1-2). In fact, when it comes to African American and Hispanic Millennials, they are "more likely than whites to get news and information at least once a day from YouTube (33 percent vs. 38 percent vs. 20 percent)" ("How Millennials Use Technology to Get News" 2015, 9).

Finally, while YouTube has become a dynamic source for news and educational content for many Millennials, it is important to note that Facebook is still the most used news source, with 88 percent of Millennials using Facebook at least occasionally, and 57 percent at least once a day, to get news and information ("How Millennials Get News" 2015). By comparison, YouTube, which is the next most popular social media network for getting news, draws 83 percent of news-seeking Millennials occasionally, but only 29 percent on a daily basis. And when it comes to the medium through which Millennials get information about their city, town,

or neighborhood, over 55 percent cite Facebook as the most common point of access ("How Millennials Get News" 2015). Given Facebook's continued prevalence in Millennials' news-seeking habits, it would be beneficial for planning departments producing educational YouTube content to also maintain an active Facebook presence, in order to promote their videos through this platform. YouTube cannot and will not be the single solution for planning departments seeking to educate and engage Millennials in urban planning issues. As Waters and Jones state, "Just as no single piece of printed collateral or single face-to-face conversation will make an organization's identity, neither will a single video; but, as the role of online video continues to increase in educating the general public, YouTube videos cannot be ignored" (Waters, Jones 2011, 261).

Appendices

All of my observations and data analysis are included in an Excel workbook called "Online Video as a Tool for Planning Education and Engagement: Channel and Video Analysis". The following is a summary of the data found in each tab of the workbook.

Tab Name	Data Description
Top 30 US Cities	30 largest U.S. cities by population, according to U.S. Census Bureau (2014b), URL to cities' YouTube channels (if available), indication whether or not the city's police department has a YouTube channel, URL to planning department YouTube channels (if available)
Age Demographics	Population of people ages 18-34 in studied cities and in the U.S., according to U.S. census Bureau (2014a)
Channels	Basic characteristics of all 8 planning department YouTube channels, as of April 16, 2016.
Videos With Meetings	Basic characteristics of all 154 videos from 7 planning department channels, as of April 18, 2016. Ranked by number of views, from largest to smallest.
Videos Without Meetings	Basic characteristics of 119 videos (excluding meeting recordings) from 7 planning department channels, as of April 18, 2016. Ranked by number of views, from largest to smallest.
Analyzed Videos	Content analysis observations of 30 sampled videos, as of April 18, 2016. Unless otherwise indicated, "0" indicates absence of an element, "1" indicates presence of an element.

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