

Google and the Creative Class

What can Google Maps tell us about the workers driving the modern economy?

Zach Underwood

zunderwood@uky.edu

Abstract

The rise of Web 2.0 and applications such as Google Maps are increasingly strengthening the connection between the real and physical worlds. Users of these sites are highly mobile and connected people, with an interest in volunteering data and collaborating to create new knowledge. These users are strikingly similar to the creative workers of Richard Florida's *Cities and the Creative Class*. Are creative workers the same group that is placing data on Google Maps? What can user-generated content on Google Maps tell us about the factors that attract the Creative Class?

Cities and the Web

An important theme when discussing geography in terms of the web is the constantly increasing connection between online places and those of the “real world.” One of the most highly connected physical environments is the city. Cities act as hubs for the movement of people, thoughts, styles, business, and more. This clustering of activity in cities is due to several different factors. Sometimes it occurs to lower transportation and shipping costs, other times it is done to bring specialized workers together into one place (Leamer & Storper, 2001). Even in industries such as finance where much of the day-to-day operations are done via the use of computers and internet, firms tend to cluster near competitors, such as financial districts in New York City and Chicago.

Leamer and Storper go on to speak specifically about the clustering of intellectual industries in cities as well. “For immaterial intellectual production, there is great value in being at the ‘center of the action,’ where the division of labor can be pursued intensively, where specialized talent and ‘buzz’ are important to keeping up with rapidly changing outputs (ideas).” As the American economy continues to move away from manufacturing, these industries will play an ever-increasing role in our GDP. It is important, then, to understand these industries and the workers of which they are made.

These businesses and intellectual ventures must originate somewhere. Richard Florida, in his book *Cities and the Creative Class* (2005), aims to understand these origins. The driving force behind the growth of many of today’s most successful cities, Florida

argues, is a group of workers he calls the Creative Class. Creative Class members have an economic output of new, unique and useful ideas. They are engineers, researchers, academics, artists, musicians, writers, and other similar professions.

A key feature of creative workers is that they are highly mobile. They have the mindset that if they don't like their current job situation, they will be willing and able to move to a new setting that offers them more. They are also connected workers. Technology now enables workers in the creative economy to be constantly accessible through email, cellular phones, text messaging, social media websites, television, and other media. The growth of smart phones has allowed access to the web virtually anywhere there is cell phone reception. This means access to large networks of people through social media sites such as Twitter and Facebook, which allow users to instantly connect and share experiences.

The rise in social media sites and other Web 2.0 products has fostered a new and exciting online community. Sites like Wikipedia have given users the tools to create knowledge as a group. Peer collaboration and user-generated content are quickly becoming the standards for the creation of new ideas and are allowing new voices to be heard (and silenced if necessary).

One such tool is Google Maps. This service is an extension of Google's popular web search engine that allows for searching based on spatial attributes. The main interface displays results using a Google-designed algorithm to look for the most relevant web resources to the spatial search being performed. This is especially useful for driving

directions or finding locations of businesses in an area. Google Maps, however, offers a more community-driven feature called My Maps. This tool allows users to input their own placemarks¹ and define them in their own words. For example, I could find my house within the Google Maps interface, add a placemark on it, and label it “My House”. Anyone with a Google account is able to upload any number of maps and placemarks that they so choose. Additionally, the support of KML² files allows users to create very intricate maps based on geo-tagged information and have very precise control over how their map appears to the end user.

The My Maps tool is an interesting example of the connection between virtual and physical worlds. Since placemarks correspond to actual coordinates in the physical world, it’s easy to see a rudimentary connection between the two. The connection grows stronger if users create placemarks at locations that are meaningful to them in their physical space. If those meaningful placemarks are then aggregated, a very real virtual world emerges that mimics the feelings of users in the physical space represented by the map. Gordon and Koo (2008) call this a “placeworld”:

“Places become placeworlds when their inhabitants imbue them with meaning through *communicative action*...Whether a street corner, a favorite hangout, a neighborhood, or a playground, places are

¹ A placemark in Google Maps is a marked point analogous to putting a pushpin in a wall map.

² Keyhole Markup Language is similar to the Hypertext Markup Language (HTML) used to build and modify web pages.

particularly well-suited for establishing common purpose among groups of people.”

Zook and Graham (2007) refer to the blending of the physical and virtual worlds as “DigiPlace”:

“DigiPlace is constantly evolving based both on the choices of users and the composition of cyberspace and physical places. In short DigiPlace encompasses the situatedness of individuals balanced between the visible and the invisible...and the blurring of lines between material place and digital representations of place.”

Words like “hyperlocal” and “bodyware” have been used to describe the link between our personal technology devices and our physical location (Sterling, 2007). GPS-enabled phones know your precise location and can send that information to friends lists to allow for face-to-face meetups. The ability to create and share geographic information on the fly with these devices, or the ability for software to enable sharing of local information by local participants, can have major impacts on the relationship we have with our physical environments (Lane, 2004).

Goodchild (2007) refers to the data uploaded from these devices or to sites like Google Maps as “volunteered geographic information (VGI),” and notes that it could one day be very useful in understanding the Earth’s surface. Furthermore, he believes “the most

important value of VGI may lie in what it can tell about local activities in various geographic locations that go unnoticed by the world's media." It is becoming increasingly clear that the database of geographic data being uploaded to Google Maps has the potential to be a gold mine of information about specific places. This information is more than just locations of bars and restaurants; it's filled with detailed descriptions of feelings about places. In other words, these are *favorite* (or least-favorite) bars and restaurants. Google's default search results tell you what its algorithm believes are the most relevant places to your search term, but user-generated content gives you information about that term created by people who have experienced the places that appear as results.

Who are these users?

The role of Web 2.0 applications is that of enabler to the user. It is an attempt at democracy online, where the masses (users) are the creators of content, rather than large companies (Beer and Burrows, 2007). As stated above, however, this content is volunteered by the user. He or she must have an interest in being mobile and superconnected, and willing to create and share information.

This is very much the profile Florida's creative worker: highly mobile, willing to relocate, and drawn to wired cities and areas of high technology growth. Members of the Creative Class have, by definition, an economic output that is new knowledge and ideas.

Creative workers with high mobility and tech savvy who are dedicated to the creation of new ideas are very likely to be the same people who are adding content to My Maps.

Creative Cities in Google Maps

Since My Maps users are likely members of the Creative Class, and are volunteering information relevant and meaningful to their lives, it is a logical progression to assume that the content uploaded to My Maps is directly related to issues that matter to the Creative Class as a whole.

The purpose of this study is, very simply, to compare the indices used by Florida to predict the location of creative workers with user-generated content in Google Maps. The goal is that user-generated content in Google Maps provides an accurate representation of the ideals present physical locations. This will be useful in understanding the behavior of creative workers and may also be helpful in judging the connectedness of the virtual world of Google Maps and the physical world it attempts to portray.

Florida's sample includes the top 50 metropolitan areas in the United States, by population, and this study will use the same 50 cities. These cities are ranked by index in Appendix 1 of *Cities and the Creative Class*, and these rankings will be compared to those generated from the numbers of search result hits for keywords that match up to three of these indices. The indices included are the Gay Index, Bohemian Index, and the

Tech-Pole Index, which are three indices with the highest correlation to Creative Class location.

Florida's Gay Index is a measure first conceived by Gary Gates of the Urban Institute who discovered high concentrations of gay populations in certain cities. Florida took this research a step further and concluded that there is also a high correlation between gay population and high-tech industry location. "To some extent," says Florida, "homosexuality represents the last frontier of diversity in our society, and thus a place that welcomes the gay community welcomes all kinds of people."

For this study, I have attempted to find a search term that would closely match up with the gay community. The most obvious search term that would correspond to physical locations that are uniquely gay is "gay bars," which will act as this study's measurement of gay activity in a particular city.

Similarly, the Bohemian Index measures the concentration of "writers, designers, musicians, actors, directors, painters, sculptors, photographers, and dancers in a region." This index is also a strong predictor of high-tech industry growth, as well as population growth and high general employment for a metropolitan area.

The "Bohemian Index" for this study is a combination of terms related to the art scene. It is a total consisting of the number of hits from the search terms: "art gallery,"

“theater,” “art schools,” “museum,” and “music.” These are intended to capture the essence of an art scene in each city by aggregating multiple art forms in ways that are likely to have spatial data associated with them. “Museum,” for example, carries the idea that art in a community is intended for public consumption, and indicates that the art scene is prevalent and accepted. “Art schools” and “art gallery” are attempts to put physical locations with painters, sculptors, designers and photographers. “Theater” makes the same attempt with actors, directors, and dancers; “music” is intended to be open-ended enough to include live music venues as well as related businesses such as guitar shops and place where music instruction is offered.

Finally, the Tech-Pole³ index is Florida’s measure of high technology industry concentration and growth, one of the most highly correlated indicators of creative economic activity. It was developed by the Milken Institute and a detailed explanation can be found in Ross DeVol’s 1999 report titled *America’s High Technology Economy: Growth, Development, and Risks for Metropolitan Areas*⁴.

Much like the actual Tech-Pole index, this study uses a combination of high-tech industries for the measurement. Included search terms are “research,” “software jobs,” “wifi,” “aerospace,” “defense contractor,” “communication services,” and

³ A “Tech Pole” is a highly concentrated area of high technology which exerts an unusually strong “technology gravitational pull” that brings concentrations of industry to areas (e.g. San Jose’s Silicon Valley).

⁴ http://www.milkeninstitute.org/pdf/ross_report.pdf

“pharmaceuticals.” These are based on industries listed in the Milken report and represent a wide section of high tech sectors.

All searches were done with identical direct links to search results, keeping the zoom level constant for each. Location and content type were each kept constant. Each search used the location term “near” (e.g. gay bars *near* San Francisco). Also, only user-created content was displayed. Search radius was left to float, as city limits are often fuzzy boundaries.

The results were analyzed both as standardized and non-standardized data. A search was done in each city for the numeral “1”, which is a regularly occurring character that is neutral to both language and subject. The results of this search served as the denominator by which the other search results were divided. This was to ensure that population wasn’t the deciding factor in the final rankings.

Making the Comparison

Over 800 unique searches were performed, with each search hit total tallied. Each of the study’s “indices” was then constructed⁵. Since Florida presents a ranking of each city from 1-50 for each index, the comparison was made based on these rankings. Cities were sorted by search results and assigned a ranking number⁶, which was then compared to Florida’s rankings via the Wilcoxon Signed Rank Test. The output of this

⁵ See Appendix 1 for the number of hits for each search.

⁶ See Appendix 2

test is a Z-score which corresponds to the probability that the two ranks are measuring the same variable. Table 1 shows the Z-scores and probabilities for each of the three indices.

Table 1

| | Z (stnd) | Probability Standardized | Z (non-stnd) | Probability Non-Standardized |
|------------------------|-----------------|---------------------------------|---------------------|-------------------------------------|
| Gay Index | -.777 | .7794 | -1.052 | .8531 |
| Bohemian Index | -.531 | .7019 | -.159 | .5596 |
| Tech-Pole Index | -.526 | .7019 | -.362 | .6406 |

The ideal level is a Z-score of 1.96 and a probability of about 95%. As is clear from the chart, this was far from the case. The null hypothesis cannot be rejected, which is to say that there is not enough evidence that the alternative hypothesis (that the two ranks are for the same variable) is true.

Obviously this is not the result this study was hoping to achieve. Based on prior research and seemingly clear connections between users of Web 2.0 and members of the Creative Class, it appeared likely that My Maps results would match Richard Florida's. Since this was not the case, it is important to now understand why these results occurred.

Deconstructing the Study

Many factors could have played a role in skewing these results. The first and most obvious of these is that the indices used in *Cities and the Creative Class* do not perfectly transition to search terms that have clear physical locations as results. For example, Florida's Gay Index measures the concentration of a specific group in a city. The search function in Google Maps is certainly not set up to map the locations of homosexual citizens in a city, so the closest alternative that was both specifically gay-oriented and had a locational component was "gay bars." There are certainly other places that homosexuals spend their time, but very few that can be tied so closely to the gay community. It's unclear as to whether a study based on indices that were easily converted to search terms would have produced significantly different results, however, but I suspect the probabilities obtained from the test would have been at least somewhat higher.

Another issue, also related to the indices used in the study, is that Florida's research was done over the decade from 1990-2000, a span in which the internet was still in its infancy (Web 1.0, if you will). Google Maps launched in February of 2005⁷, half a decade after Florida's study was complete and the dot.com bubble had burst (which changed both the makeup of the web as well as the physical environments of places like Silicon Valley). Technologies like Web 2.0, smart phones, and a wide array of GPS-enabled

⁷ <http://www.google.com/corporate/history.html#9>

devices in the last few years has created a new culture of ultra-connected and mobile workers, far more so than Florida could have imagined in the 90s.

Furthermore, one of the most interesting indices in the book, the Coolness Index, which is a measure of the amenities attractive to creative workers (coffee shops, night clubs, restaurants, etc.) was not included with the other ranked indices. This index clearly has the ability to easily translate to physical locations. Most importantly these are the types of locations that are likely to carry meaning to people and therefore most likely to be mapped in Google Maps. This study included some searches for these topics, but without data to compare they were ultimately not used.

Another issue is that it's possible these topics are more complex than Florida makes them out to be. While the search terms were not perfect, they were adequate in conveying a similar meaning as the Creative Class indices. It is entirely possible that users who are uploading geographic data to Google Maps are indeed creative workers and that they are uploading meaningful data not explored by Florida. For example, it would be entirely possible for creative workers to seek out cities with vibrant waterfronts, certain climates, or even cities whose planning commission has provisions for live/work communities and mixed-use developments. There is no data to show that this is the case, but all are reasonably attractive aspects of cities, and therefore it is entirely possible that they have an effect of the Creative Class.

Finally, the nature of the data compared leaves a lot to be desired. Ranked data does not lend itself well to comparison, and raw data that could be easily correlated would be preferred. However, relevant raw data was not available from Florida's study, and ranks were the next best option. Had these search hits been compared to the specific census data or industrial location data used by Florida and his researchers, the results may have been different.

While this study was in no way a perfect measure of creative class activity, I feel that it was, at least in some ways, important data to collect. This is current data from a variety of different topics that shows how people are using Google My Maps to upload data about their areas. Also, patterns emerged as more and more searches were completed. For example, Milwaukee, WI consistently ranked high in search results, but low on the Creative Class indices, a possible indication rapid growth in the area since 2000. Also, Baltimore, MD ranked very high in most cases, partially due to spillover results from the Washington, DC area. This could show that the two cities, located very close to each other, share a sort of symbiotic relationship. This could be an important issue to exploit for each city when discussing strategies for attracting creative workers and encouraging economic development.

Conclusions

While this study did not show the expected connections between Google Maps users and the Creative Class, the fact that the two groups very likely share the same traits remains. Both encompass highly connected individuals who place high importance on place. Creative Class members, as discussed by Richard Florida, have high expectations when it comes to the cities in which they choose to work. My Maps users create placemarks and share them with the public based on locations in the physical environment that carry personal meaning.

Google Maps continues to be an important tool for the recreation of physical spaces in a virtual setting. Whether users are creating the “placeworlds” of Gordon and Koo, or the “DigiPlace” of Zook and Graham, the meaning given to a physical location when a placemark is created is a clear example of how virtual and physical worlds are becoming increasingly connected.

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Appendix 1 – Total Hits by Keyword

| City | State | gay bar | art gallery | research | coffee shop | software | jobs | theater | art schools | museum | night club | wifi | music | aerospace |
|-----------------|-------|---------|-------------|----------|-------------|----------|-------|---------|-------------|--------|------------|-------|-------|-----------|
| San Francisco | CA | 467 | 1910 | 9182 | 13833 | 1269 | 9897 | 936 | 14135 | 1225 | 2357 | 15416 | 155 | |
| Boston | MA | 208 | 839 | 3497 | 5139 | 552 | 6141 | 662 | 9643 | 907 | 749 | 8303 | 140 | |
| Seattle | WA | 87 | 794 | 1820 | 7790 | 746 | 2600 | 435 | 5521 | 479 | 701 | 7037 | 263 | |
| Washington | DC | 147 | 3503 | 3794 | 5247 | 777 | 6980 | 613 | 15093 | 1173 | 879 | 7442 | 252 | |
| Dallas | TX | 97 | 498 | 1307 | 2229 | 193 | 4248 | 327 | 3549 | 422 | 524 | 5534 | 155 | |
| Los Angeles | CA | 363 | 2236 | 4132 | 11297 | 363 | 16620 | 617 | 12003 | 1350 | 1177 | 14844 | 667 | |
| Chicago | IL | 151 | 817 | 2218 | 5923 | 281 | 12057 | 801 | 11514 | 1253 | 799 | 9975 | 66 | |
| Atlanta | GA | 124 | 523 | 958 | 2841 | 199 | 1119 | 123 | 2284 | 173 | 395 | 4125 | 79 | |
| Phoenix | AZ | 36 | 202 | 788 | 2823 | 226 | 2500 | 149 | 1920 | 223 | 452 | 1885 | 231 | |
| New York | NY | 1137 | 2999 | 6664 | 14671 | 629 | 26233 | 1403 | 43229 | 2216 | 2733 | 26992 | 371 | |
| Philadelphia | PA | 76 | 685 | 2995 | 4167 | 191 | 6878 | 594 | 9244 | 2204 | 551 | 8557 | 130 | |
| San Diego | CA | 87 | 246 | 1362 | 5887 | 229 | 1848 | 107 | 3729 | 224 | 238 | 2233 | 333 | |
| Denver | CO | 110 | 399 | 1799 | 3674 | 247 | 5587 | 255 | 4503 | 376 | 580 | 4628 | 165 | |
| Austin | TX | 70 | 238 | 4276 | 3148 | 123 | 1976 | 172 | 1881 | 291 | 908 | 6330 | 45 | |
| Houston | TX | 34 | 573 | 1550 | 2019 | 94 | 2551 | 276 | 3509 | 546 | 406 | 5695 | 74 | |
| Portland | OR | 55 | 638 | 1279 | 5558 | 122 | 2813 | 287 | 2359 | 223 | 406 | 12970 | 12 | |
| Indianapolis | IN | 5 | 117 | 624 | 1304 | 63 | 872 | 291 | 1846 | 410 | 182 | 6850 | 38 | |
| Kansas City | MO | 29 | 86 | 512 | 2031 | 28 | 1703 | 80 | 2005 | 53 | 730 | 1456 | 39 | |
| Minneapolis | MN | 59 | 280 | 775 | 4406 | 124 | 4428 | 161 | 2030 | 507 | 549 | 4324 | 82 | |
| St. Louis | MO | 42 | 161 | 600 | 1337 | 69 | 1939 | 17 | 2276 | 289 | 123 | 1795 | 75 | |
| Orlando | FL | 32 | 98 | 1186 | 1506 | 104 | 1837 | 70 | 1285 | 289 | 240 | 2293 | 156 | |
| Sacramento | CA | 23 | 275 | 2224 | 3389 | 61 | 2606 | 217 | 2344 | 209 | 531 | 2847 | 124 | |
| Detroit | MI | 48 | 315 | 4063 | 2737 | 136 | 4795 | 190 | 2607 | 1325 | 488 | 4043 | 61 | |
| San Antonio | TX | 7 | 128 | 983 | 2743 | 30 | 1333 | 109 | 1309 | 3707 | 217 | 3003 | 57 | |
| Pittsburgh | PA | 19 | 689 | 990 | 2074 | 76 | 2076 | 144 | 2459 | 187 | 312 | 2647 | 19 | |
| West Palm Beach | FL | 135 | 589 | 1480 | 1299 | 475 | 2387 | 91 | 2635 | 572 | 237 | 3098 | 102 | |
| Tampa | FL | 23 | 207 | 1585 | 1274 | 95 | 2196 | 175 | 1814 | 262 | 194 | 1676 | 67 | |
| Columbus | OH | 56 | 162 | 585 | 1307 | 47 | 1484 | 95 | 1719 | 129 | 429 | 1843 | 58 | |
| Salt Lake City | UT | 8 | 170 | 2607 | 639 | 59 | 1759 | 113 | 933 | 61 | 215 | 1145 | 122 | |
| Birmingham | AL | 0 | 72 | 294 | 424 | 24 | 675 | 28 | 694 | 41 | 109 | 628 | 18 | |
| Baltimore | MD | 158 | 3594 | 4187 | 5833 | 791 | 8050 | 669 | 16336 | 1239 | 1081 | 8497 | 259 | |
| Cincinnati | OH | 4 | 227 | 601 | 1107 | 69 | 1805 | 111 | 2481 | 200 | 307 | 1916 | 100 | |
| Charlotte | NC | 2 | 68 | 864 | 1045 | 50 | 1318 | 93 | 997 | 107 | 160 | 1700 | 9 | |
| Dayton | OH | 2 | 368 | 1041 | 2162 | 118 | 3159 | 187 | 3035 | 236 | 519 | 3502 | 131 | |
| Milwaukee | WI | 166 | 722 | 1176 | 4632 | 179 | 8255 | 437 | 5775 | 741 | 1064 | 8235 | 58 | |
| Cleveland | OH | 4 | 184 | 664 | 1279 | 32 | 1487 | 96 | 2057 | 198 | 205 | 3728 | 72 | |
| Miami | FL | 135 | 571 | 1418 | 1230 | 470 | 1986 | 205 | 2522 | 566 | 226 | 3009 | 96 | |
| Rochester | NY | 20 | 136 | 438 | 716 | 34 | 1192 | 42 | 1129 | 71 | 145 | 1323 | 33 | |
| Albany | NY | 27 | 90 | 567 | 648 | 50 | 1219 | 82 | 1811 | 45 | 98 | 1274 | 30 | |
| Nashville | TN | 13 | 106 | 889 | 1086 | 30 | 743 | 48 | 1072 | 76 | 119 | 5835 | 24 | |
| Greensboro | NC | 3 | 127 | 2280 | 1555 | 82 | 1372 | 109 | 1703 | 89 | 240 | 2480 | 43 | |
| Oklahoma City | OK | 6 | 42 | 334 | 441 | 24 | 339 | 24 | 708 | 21 | 92 | 719 | 42 | |
| Las Vegas | NV | 120 | 165 | 283 | 973 | 28 | 1901 | 28 | 1152 | 1199 | 433 | 1609 | 43 | |
| Norfolk | VA | 1 | 75 | 1068 | 536 | 29 | 589 | 26 | 1286 | 70 | 158 | 578 | 63 | |
| Richmond | VA | 15 | 197 | 585 | 981 | 28 | 998 | 80 | 1676 | 68 | 166 | 1218 | 43 | |
| Buffalo | NY | 15 | 617 | 847 | 722 | 99 | 1486 | 71 | 1358 | 235 | 259 | 1506 | 56 | |
| New Orleans | LA | 117 | 163 | 1531 | 1739 | 12 | 868 | 87 | 1540 | 382 | 127 | 3050 | 2 | |
| Honolulu | HI | 12 | 87 | 337 | 634 | 7 | 376 | 31 | 1408 | 108 | 158 | 630 | 37 | |
| Memphis | TN | 8 | 44 | 415 | 423 | 2 | 748 | 36 | 1290 | 70 | 116 | 1144 | 19 | |
| Louisville | KY | 3 | 64 | 366 | 640 | 34 | 688 | 62 | 1273 | 73 | 87 | 984 | 22 | |

| City | State | defense contractor | communication services | pharmaceuticals | 1 (control) |
|-----------------|-------|--------------------|------------------------|-----------------|-------------|
| San Francisco | CA | 20 | 2126 | 360 | 205474 |
| Boston | MA | 4 | 1758 | 646 | 132377 |
| Seattle | WA | 3 | 749 | 59 | 99144 |
| Washington | DC | 102 | 2676 | 178 | 147558 |
| Dallas | TX | 6 | 1419 | 90 | 53179 |
| Los Angeles | CA | 12 | 2018 | 323 | 178266 |
| Chicago | IL | 9 | 1314 | 295 | 109502 |
| Atlanta | GA | 0 | 794 | 96 | 105894 |
| Phoenix | AZ | 6 | 739 | 68 | 36374 |
| New York | NY | 7 | 4456 | 1542 | 250704 |
| Philadelphia | PA | 3 | 1930 | 780 | 110087 |
| San Diego | CA | 9 | 658 | 418 | 64341 |
| Denver | CO | 1 | 1016 | 63 | 60902 |
| Austin | TX | 1 | 434 | 30 | 44405 |
| Houston | TX | 20 | 434 | 102 | 48710 |
| Portland | OR | 1 | 626 | 10 | 47872 |
| Indianapolis | IN | 1 | 468 | 11 | 30390 |
| Kansas City | MO | 0 | 296 | 62 | 32462 |
| Minneapolis | MIN | 2 | 449 | 27 | 48541 |
| St. Louis | MO | 0 | 327 | 53 | 33444 |
| St. Louis | FL | 2 | 538 | 34 | 51732 |
| Orlando | FL | 15 | 538 | 34 | 51732 |
| Sacramento | CA | 1 | 498 | 56 | 60054 |
| Detroit | MI | 0 | 544 | 119 | 51274 |
| San Antonio | TX | 0 | 360 | 26 | 30931 |
| Pittsburgh | PA | 2 | 440 | 67 | 30773 |
| West Palm Beach | FL | 1 | 903 | 138 | 70496 |
| Tampa | FL | 0 | 498 | 51 | 46256 |
| Columbus | OH | 1 | 290 | 23 | 25271 |
| Salt Lake City | UT | 2 | 410 | 35 | 49379 |
| Birmingham | AL | 1 | 208 | 38 | 13782 |
| Baltimore | MD | 90 | 2837 | 228 | 162840 |
| Cincinnati | OH | 2 | 515 | 56 | 39105 |
| Charlotte | NC | 0 | 359 | 28 | 29338 |
| Dayton | OH | 3 | 669 | 68 | 54938 |
| Milwaukee | WI | 0 | 936 | 237 | 71261 |
| Cleveland | OH | 0 | 211 | 31 | 28220 |
| Miami | FL | 0 | 872 | 137 | 52420 |
| Rochester | NY | 0 | 307 | 22 | 18821 |
| Albany | NY | 0 | 261 | 32 | 25748 |
| Nashville | TN | 0 | 310 | 22 | 18102 |
| Greensboro | NC | 0 | 376 | 111 | 32638 |
| Oklahoma City | OK | 0 | 283 | 21 | 14533 |
| Las Vegas | NV | 1 | 342 | 29 | 35321 |
| Norfolk | VA | 2 | 563 | 3 | 22886 |
| Richmond | VA | 3 | 311 | 23 | 23449 |
| Buffalo | NY | 0 | 529 | 47 | 28520 |
| New Orleans | LA | 0 | 287 | 21 | 33461 |
| Honolulu | HI | 1 | 217 | 5 | 13875 |
| Memphis | TN | 1 | 216 | 13 | 13296 |
| Louisville | KY | 0 | 255 | 15 | 15150 |

Appendix 2 - Ranks

| City | Gay Index | Google Standardized | Google Non-Standardized |
|-----------------|-----------|---------------------|-------------------------|
| San Francisco | 1 | 6 | 2 |
| Washington | 2 | 22 | 8 |
| Austin | 3 | 12 | 19 |
| Atlanta | 4 | 18 | 11 |
| San Diego | 5 | 15 | 17 |
| Seattle | 6 | 27 | 16 |
| Los Angeles | 7 | 8 | 3 |
| Boston | 8 | 13 | 4 |
| Sacramento | 9 | 39 | 30 |
| Denver | 10 | 11 | 14 |
| Orlando | 11 | 33 | 27 |
| Miami | 12 | 4 | 10 |
| Rochester | 13 | 20 | 32 |
| New York | 14 | 1 | 1 |
| Chicago | 15 | 14 | 7 |
| West Palm Beach | 16 | 9 | 9 |
| Minneapolis | 17 | 17 | 20 |
| Tampa | 18 | 37 | 31 |
| Dallas | 19 | 10 | 15 |
| Honolulu | 20 | 28 | 37 |
| Houston | 21 | 30 | 26 |
| Phoenix | 22 | 23 | 25 |
| Portland | 23 | 19 | 22 |
| New Orleans | 24 | 2 | 13 |
| Columbus | 25 | 7 | 21 |
| Dayton | 26 | 49 | 48 |
| Oklahoma City | 27 | 38 | 41 |
| Nashville | 28 | 29 | 36 |
| Richmond | 29 | 32 | 34 |
| Albany | 30 | 21 | 29 |
| Baltimore | 31 | 24 | 6 |
| San Antonio | 32 | 40 | 40 |
| Memphis | 33 | 35 | 39 |
| Indianapolis | 34 | 42 | 42 |
| Kansas City | 35 | 26 | 28 |
| Philadelphia | 36 | 31 | 18 |
| Norfolk | 37 | 48 | 49 |
| Cincinnati | 38 | 45 | 43 |
| Pittsburgh | 39 | 34 | 33 |
| Milwaukee | 40 | 5 | 5 |
| Salt Lake City | 41 | 43 | 38 |
| Louisville | 42 | 41 | 46 |
| Charlotte | 43 | 47 | 47 |
| Detroit | 44 | 25 | 23 |
| St. Louis | 45 | 16 | 24 |
| Greensboro | 46 | 46 | 45 |
| Cleveland | 47 | 44 | 44 |
| Las Vegas | 48 | 3 | 12 |
| Birmingham | 49 | 50 | 50 |
| Buffalo | 50 | 36 | 35 |

| City | Tech Pole | Google Standardized | Google Non-Standardized |
|-----------------|------------------|----------------------------|--------------------------------|
| San Francisco | 1 | 6 | 2 |
| Boston | 2 | 23 | 6 |
| Seattle | 3 | 43 | 11 |
| Washington | 4 | 18 | 5 |
| Dallas | 5 | 8 | 13 |
| Los Angeles | 6 | 37 | 4 |
| Chicago | 7 | 41 | 10 |
| Atlanta | 8 | 50 | 23 |
| Phoenix | 9 | 9 | 24 |
| New York | 10 | 10 | 1 |
| Philadelphia | 11 | 15 | 7 |
| San Diego | 12 | 31 | 18 |
| Denver | 13 | 12 | 12 |
| Austin | 14 | 1 | 8 |
| Houston | 15 | 19 | 21 |
| Portland | 16 | 32 | 26 |
| Indianapolis | 17 | 40 | 39 |
| Kansas City | 18 | 30 | 34 |
| Minneapolis | 19 | 46 | 28 |
| St. Louis | 20 | 48 | 40 |
| Orlando | 21 | 42 | 27 |
| Sacramento | 22 | 20 | 15 |
| Detroit | 23 | 2 | 9 |
| San Antonio | 24 | 26 | 33 |
| Pittsburgh | 25 | 13 | 30 |
| West Palm Beach | 26 | 38 | 17 |
| Tampa | 27 | 27 | 25 |
| Columbus | 28 | 22 | 37 |
| Salt Lake City | 29 | 7 | 16 |
| Birmingham | 30 | 34 | 50 |
| Baltimore | 31 | 21 | 3 |
| Cincinnati | 32 | 45 | 35 |
| Charlotte | 33 | 35 | 36 |
| Dayton | 34 | 39 | 22 |
| Milwaukee | 35 | 33 | 14 |
| Cleveland | 36 | 44 | 41 |
| Miami | 37 | 14 | 19 |
| Rochester | 38 | 28 | 45 |
| Albany | 39 | 47 | 44 |
| Nashville | 40 | 5 | 38 |
| Greensboro | 41 | 3 | 20 |
| Oklahoma City | 42 | 25 | 46 |
| Las Vegas | 43 | 49 | 42 |
| Norfolk | 44 | 4 | 31 |
| Richmond | 45 | 36 | 43 |
| Buffalo | 46 | 11 | 32 |
| New Orleans | 47 | 16 | 29 |
| Honolulu | 48 | 24 | 49 |
| Memphis | 49 | 17 | 47 |
| Louisville | 50 | 29 | 48 |

| City | Bohemian | Google Standardized | Google Non-Standardized |
|-----------------|-----------------|----------------------------|--------------------------------|
| Seattle | 1 | 36 | 11 |
| Los Angeles | 2 | 10 | 2 |
| New York | 3 | 2 | 1 |
| Nashville | 4 | 1 | 26 |
| Portland | 5 | 3 | 10 |
| Washington | 6 | 19 | 6 |
| Minneapolis | 7 | 17 | 16 |
| San Francisco | 8 | 20 | 3 |
| Boston | 9 | 23 | 8 |
| Austin | 10 | 14 | 17 |
| Las Vegas | 11 | 42 | 38 |
| Orlando | 12 | 48 | 35 |
| Atlanta | 13 | 50 | 23 |
| Denver | 14 | 12 | 12 |
| Dallas | 15 | 8 | 13 |
| West Palm Beach | 16 | 46 | 20 |
| Honolulu | 17 | 28 | 48 |
| San Diego | 18 | 44 | 24 |
| Cincinnati | 19 | 35 | 29 |
| Chicago | 20 | 6 | 5 |
| Greensboro | 21 | 30 | 33 |
| Kansas City | 22 | 37 | 36 |
| Salt Lake City | 23 | 49 | 43 |
| Phoenix | 24 | 27 | 28 |
| Detroit | 25 | 16 | 15 |
| Richmond | 26 | 29 | 42 |
| Miami | 27 | 38 | 21 |
| Milwaukee | 28 | 4 | 9 |
| Columbus | 29 | 34 | 40 |
| Houston | 30 | 11 | 14 |
| Rochester | 31 | 21 | 44 |
| Tampa | 32 | 43 | 31 |
| Louisville | 33 | 22 | 46 |
| Indianapolis | 34 | 5 | 19 |
| Philadelphia | 35 | 15 | 7 |
| Charlotte | 36 | 40 | 41 |
| Norfolk | 37 | 47 | 47 |
| St. Louis | 38 | 26 | 30 |
| Sacramento | 39 | 41 | 22 |
| Memphis | 40 | 13 | 45 |
| New Orleans | 41 | 33 | 34 |
| Birmingham | 42 | 49 | 49 |
| Dayton | 43 | 25 | 18 |
| Baltimore | 44 | 18 | 4 |
| Albany | 45 | 32 | 39 |
| Pittsburgh | 46 | 9 | 25 |
| Cleveland | 47 | 7 | 27 |
| Buffalo | 48 | 31 | 37 |
| Oklahoma City | 49 | 45 | 50 |
| San Antonio | 50 | 24 | 32 |