

# **Synthesizing Public Opinions on Transportation Issues and Needs**

REVIEWING SURVEYED OPINIONS PRESENTED  
IN PAST RESEARCH

Prepared by Andrew Harris  
for  
Southwest Washington Regional Transportation Council

April 9, 2018

# Synthesizing Public Opinions on Transportation Issues and Needs

## EXECUTIVE SUMMARY

### BRIEF OVERVIEW

The focus of this synthesis is on the largest pieces of publicly accessible research on transportation in the region that can be effectively utilized. After the foundational stages of work, I was left with a total research corpus of over 3.4 million words gathered from public opinion surveys throughout the region (listed in the appended work). Having the advantage of a large body of response data enables sectional analysis of relevant observations on a myriad of categorical levels.

### NOTES ON METHODOLOGY

For this study I began by cataloguing each data point by origin, length, means of record, time frame, geography, and social demographics when applicable. From this stage, I constructed a frequency analysis like those above that can be sectionally manipulated to identify frequencies within cross-sections of data. I used distorted *n*-grams of words to develop a pattern of likely usage across swaths of public opinion. This framed a basic understanding of the webs – called tries – that form collective conversations within a section of public dialog.

Each opinion response was algorithmically assigned a sentiment score ranging from zero to one, this is a measure of the overall “positivity” of the text in question. Every data point was scored for lexical variation to determine commonalities in expressed themes. After assigning firm linguistic character measures to each response, it became possible to plot the overall sentiment of the community on given issues or in given areas. These steps are backed by a proven, peer-reviewed formula that I am happy to share if there is an interest but have omitted here in the interest brevity.

### KEY FINDINGS

In this case, the analysis reveals a community that supports a progressive approach to transportation and is willing to foot the bill. In cases included in this inquiry, a strong base of support of a new bridge – in place of the I-5 – outweighs the sentiment that suggests the project should not move forward. Specifically, the research indicates that 56% of expressed sentiment favor advancing a bridge project while 20% of survey respondents expressed a negative sentiment. The remaining 24% of opinions expressed a positively skewed neutral sentiment.

Supporters of an expanded bridge project acknowledge that there is an increased cost required as well as a social burden that must be endured. These issues are mentioned most often in longer responses, that are over six clauses or 50 words, which go on to mention the economic necessity of unclogging this major artery along the I-5. Similarly, responses that express starkly negative responses are often shorter, fewer than 30, and express little else.

## OVERVIEW

In the following pages you will find an investigation of prominent reports, surveys, and studies conducted across the last decade that have been identified as useful measures of public opinion. Common themes of these studies focus on understanding how a range of issues impact the Vancouver-Portland metro region. For consideration in this research we chose to isolate for consideration the responses directly related to transportation and transit issues and themes.

By seeking greater understanding of likely public moods and responses to major transportation issues, the Southwest Washington Regional Transportation Council may responsively address the needs of the community. While some efforts have been made by various councils and bodies (C-TRAN, RTC, ODOT, etc.,) to understand public opinion related to narrowly tailored research topics, there has been no widely published comprehensive effort to synthesize and utilize common public opinions. The primary intent of this project is to further sharpen a discussion about the future of transportation in the Vancouver/Portland metro area through an increased awareness of common social, semantic, and cultural commonalities and aversions.

For this synthesis the focus is on the largest pieces of publicly accessible research on transportation in the region that can be effectively utilized. After the foundational stages of work, I was left with a total research corpus of over 3.4 million words. Having the advantage of a large body of response data enables sectional analysis of relevant observations on a myriad of categorical levels.

## FRAMING A LINGUISTIC ANALYSIS

Typically, linguistic and semantic analysis are used as a means of accessing public opinion or social moods that are difficult to actualize using surface survey methods. By amassing a large body of free form responses, a considerable body of language can be displayed in entirety rather than as individual data points. In much the same way a traditional quantitative study may illuminate trends in financial or population movement, linguistic analysis provides the same opportunity to quantify language usage and study it as an organic body. Often linguistic studies highlight nuances in themes that are not understood by base responses. By listening to the widest body of voices possible, it is possible to balance the most intense opinions, often expressed loudly and infrequently, with

more commonly supported opinions that are often voiced less zealously. This sort of understanding is essential as it lessens the chance of a vocal, visible majority overtaking the more popular courses of action.

In looking to conduct a language focused study of available surveys and research materials, accessing a large body of freeform text and a diverse sample of respondents is paramount. In the specific case of transportation issues there exists a sizeable body of readily quantifiable survey response data as well as an equally developed corpus of open form public response. For the sake of this study, it will be helpful to rationalize both modes of available data in parallel so that they may be viewed in contrast. Likewise, conducting a semantic and thematic study of the body of language within published survey questions allows for the construction of an authoritative or legislative narrative that may inform the response patterns of the survey answers and guide construction of future survey instruments.

Much of the transportation narrative in Southwest Washington over the last decade seems to have been dominated by the expansion of emerging communities in response to growth across the river. Likewise, much discussion has been made of the essential pain points generated by such a regional influx. Projects like the Columbia River Crossing or the possibility of a new transit line dominate a significant portion of targeted surveys and a substantial portion of collected responses.

Before beginning a project such as this, a preliminary survey of the body of language is usually a first logical step. Typically, a linguistic study of a body of public opinion begins with the isolation of an administrative voice within the framework of public response. Beginning with an analysis of language allows a more focused approach to massaging the public responses. Identifying prominent themes in discourse allows an honest foundation for evaluating public responses to administrative propositions.

For this project I have selected several sizeable measures of public opinion for review, they are; the collected entries of the Voice of Washington public opinion database, the Oregon Transportation Needs and Issues Survey, the transportation elements of the Oregon Values and Beliefs Project, and the 500,000 Voices project sponsored by the Community Foundation of Southwest Washington. Each of these surveys or reports provides a large body of language for analysis as well as a prominent community focus.

As mentioned earlier, before beginning a full algorithmic analysis of word findings, semantics, isolations, fixations, sentiments, and value it is helpful to review work published by surveying agencies related to the conducted surveys. Think of this as a sort of preface or abstract for the project – a sample that outlines how agencies seem to perceive the issues they’ve asked the public for opinions on. After framing an agencies vocabulary and topical tendencies, a dialogue can be constructed by working through the full range of analyses while incorporating the public voice.

## METHODOLOGY

For this study I began by cataloguing each data point by origin, length, means of record, time frame, geography, and social demographics when applicable. Each data point was catalogued in to a searchable MySQL database that can be easily queried for specific results and programmatically manipulated with ease. From this stage, I constructed a frequency analysis like those above that can be sectionally manipulated to identify frequencies within cross-sections of data – for example how are attitudes in Clark County oriented toward the phrase “new bridge” or “increased spending.” Moving beyond the basic analysis above I used distorted *n*-grams of words to develop a pattern of likely usage across swaths of public opinion. This framed a basic understanding of the webs – called tries – that form collective conversations within a section of public dialog. These can be plotted should that be of interest.

After a basic analysis of the *content* of the given public responses, the project moved into analyzing the tone and character of the text. Each opinion response was algorithmically assigned a sentiment score ranging from zero to one, this is a measure of the overall “positivity” of the text in question – the closer to “1” the higher the favorability. Every data point was scored for lexical variation to determine commonalities in expressed themes (i.e. “is road funding always discussed as a futile issue”). After assigning firm linguistic character measures to each response, it became possible to plot the overall sentiment of the community on given issues or in given areas. These steps are backed by a proven, peer-reviewed formula that I am happy to share if there is an interest but have omitted here in the interest of brevity.

After all data points were linguistically scored and individually evaluated, I used the overall themes that are present in each report to enumerate the sectional traits of the data. By staging this study foundationally and moving through the

analysis in a modular way with each section informing the next, I believe we are able to share a truly honest, organic story.

## SUMMARY OF FINDINGS

Although not definitive, language analysis has been proven to deliver meaningful insights into populations. In this case, the analysis reveals a community that supports a progressive approach to transportation and is willing to foot the bill. In cases included in this inquiry, a strong base of support of a new bridge – in place of the I-5 – outweighs the sentiment that suggests the project should not move forward.

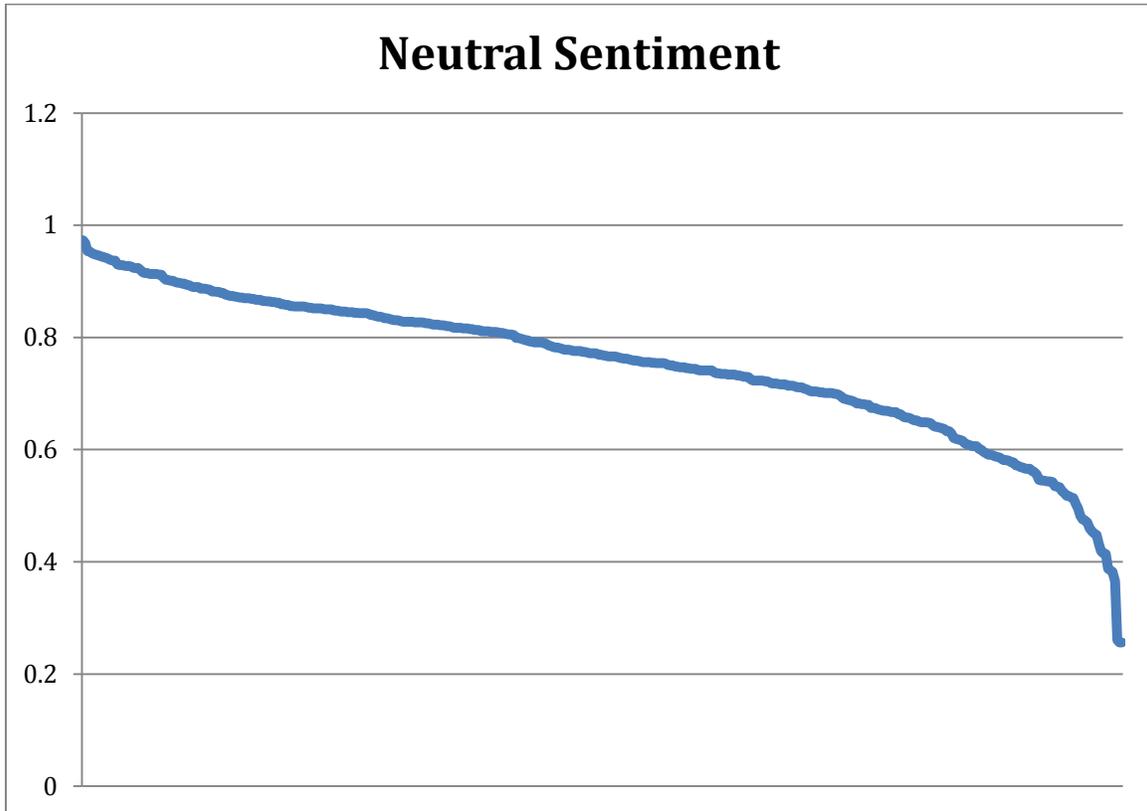
Supporters of an expanded bridge project acknowledge that there is an increased cost required as well as a social burden that must be endured. These issues are mentioned most often in longer responses, that are over six clauses or 50 words, which go on to mention the economic necessity of unclogging this major artery along the I-5. Similarly, responses that express starkly negative responses are often shorter, fewer than 30, and express little else.

Quantitatively representing public opinion after conducting research such as this often allows for quick absorption of data that is often more clear. In the following pages, sentiment is plotted on an X-Y axis; the area that falls below the sloped line can be thought of as the body of support for the particular sentiment. Typically the opinions expressed in these are most intense above the 0.5 marks. Using these graphs, a clear neutral population can be observed as is typical of public opinion surveys in which few respondents write more than 20 words.

In cases where a positive or negative opinion is strongly expressed, it is less intense among the negative population wherein a few voices strongly express a sharp opinion before falling quickly. On the positive side, the strength of sentiment decays at a much slower rate after initializing in a stronger position; the peak of positive sentiment falling at 0.79 and the peak of negative sentiment at 0.53. Indeed, were the positive and negative sentiment visualized on the same axis, you would notice that the negative population represents around 59% of the total expressed opinion, indicating a much stronger positive community voice.



- Many neutral responses offered items for further consideration including environmental impact, the possibility of green space inclusion, the benefits of replacement, and the economic impact increased access

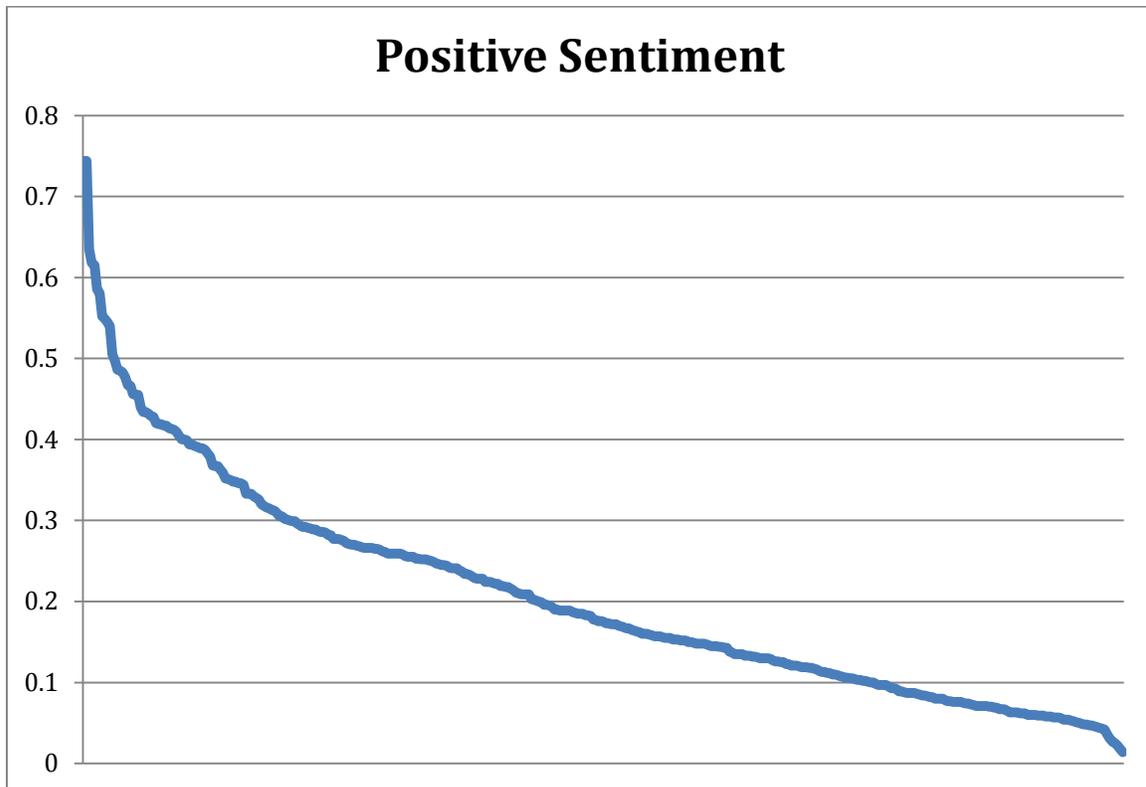


## NEUTRAL SENTIMENT INDICATIONS

- The majority of neutral expressions indicate a positive inclination toward the idea of expanding the transportation in the Southwest Washington/Portland Metro Area
- The sentiment of those responses that trended negative represent roughly 8% of the population (indicated by the dip below .5 at the end of the plotline)
- Frequent use of investigative terms trend positively as subjects attempt to guide policy makers toward issues that they believe will round out the overall discussion
- Upwards of 30% of the neutral population falls above the .8 mark in sentiment, in this case indicating a positive framing of transportation issues



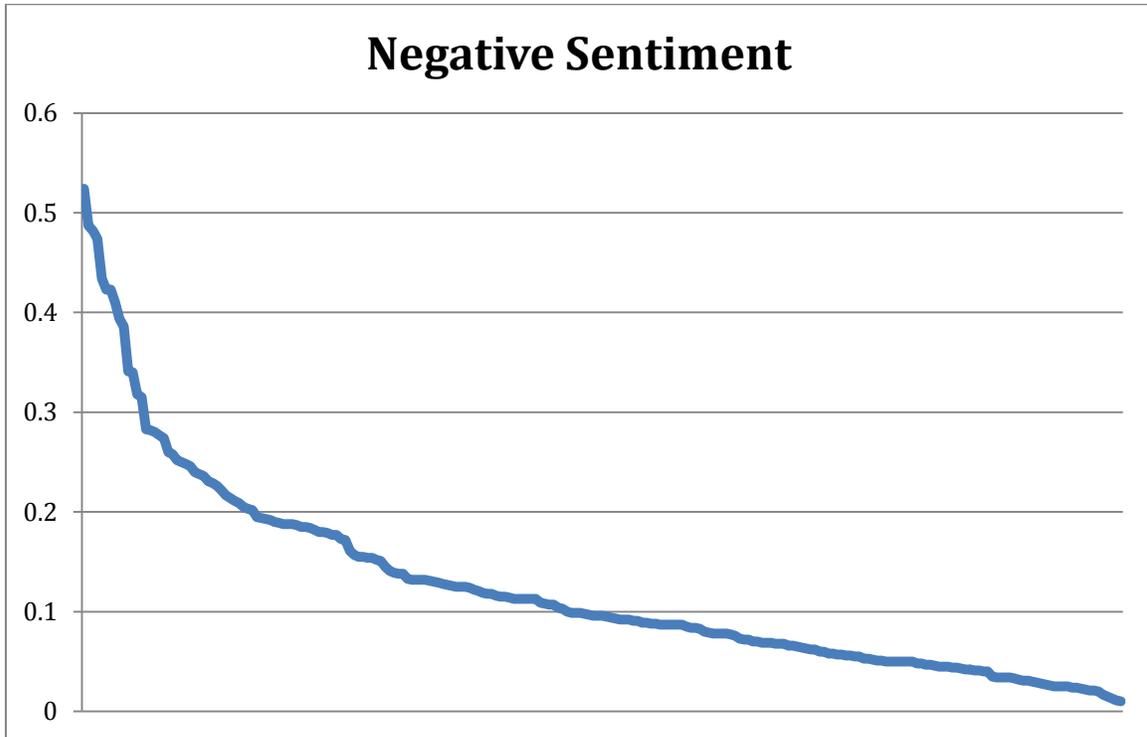
- Economic competitiveness is indicated as a need for increasing transportation options, words like “**jobs**”, “**employment**”, “**commute**”, and “**opportunities**” indicate a financial need for more options
- The overall attractiveness of the region and value of homes is a frequently mentioned concept



## POSITIVE SENTIMENT INDICATIONS

- While the bulk of the considered response pool trended positive, the trends within the subset of positive responses were weaker
- Roughly 5% of the positive response population indicated a very strong opinion while the rest of the group trends toward a more subdued response
- A weak positive opinion group may indicate a waning support base or could indicate a population that has resigned itself to accept certain transportation challenges
- The overall size of the response pool (falling below the trend line) is among the most important factors for consideration rather than





## NEGATIVE SENTIMENT INDICATIONS

- When compared to the positive response pool, the negative group holds less intense opinions that appear to taper at a slower rate
- A slowly tapering sentiment, as shown above, often indicates a persistent presentation of opinion that is likely repetitive
- The idea that the negative response group may be less diverse in ideology is supported by the fact that over **60%** of response cases mentioned a fear of that would be brought into Southwest Washington should travel(?) become easier.
- The negative response pool has the shortest average response when compared to the neutral and positive subgroups; this indicates a quick opposition and pre-conceived opinion. An example sentiment related to light rail transit
- Negative responses represent roughly **20%** of the overall response body

## RESEARCHER CONCLUSIONS

This research represents my first interaction with the Southwest Washington Regional Transportation Council in a professional capacity. I utilize the regional transportation network every day as a professional and traveling member of the Vancouver community and it is apparent that transportation issues are all around us. Through my personal and professional interaction with RTC, and the data I've discussed in this report, I've been able to develop a multifaceted understanding of these issues and how they've been discussed.

As a community member and an applied policy professional I am concerned by the understanding I've grown. What I have seen shows a game of political chicken that has hampered voices and economic development in the region. In nearly every study I consulted it seemed that there was a tone of agenda setting and a quest for ideological support that far outweighed the need to measure the *actual opinions of real constituents*.

In many cases, particular around election season the polarity of discussion has virtually silenced the reasonable middle way resulting in the rejection or expiration of multiple funding offers. Attempts to keep Clark County and surrounding areas as they have been historically are weakening the overall willingness to discuss the issues (as demonstrated by our massive neutral voice). If a campaign of attrition intended to make the issue go away as community members grow tired of it is intended – it may be working.

Weakening public opinion by polarizing what is expressed and then extending fruitless discussions for the sake of policy trading is likely not the best way to treat one of the world's most vital economic corridors. Anecdotally, one of the most alarming statistics I've encountered suggests that a new I-5 bridge at Vancouver would shorten the commute through Portland by 12 minutes for truck traffic adding an estimated 5 billion dollars back into the national economy.

Regardless of the form the discussion takes – the bridge in question is over a century old and it won't stand another. We will build another bridge. Residents of the Vancouver-Portland community and the greater northwest owe a careful decision to future generations. This decision should be prescribed by hearing – truly hearing public opinion – before enacting a policy lest our grandchildren find us foolhardy.