A COMPARATIVE ANALYSIS OF VANPOOL AND SINGLE OCCUPANT COMMUNTERS' SELF-REPORTED STRESS LEVEL BEFORE AND AFTER THE COMMUTE

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A

PROJECT

Presented to the Faculty

of the University of Alaska Anchorage

in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF SCIENCE

By

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Anchorage, Alaska

December 2015

Disclaimer

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Abstract

Stress—and its impact on personal health and overall wellness—is a well-researched topic. Countless studies are devoted to the effects of stress and its correlation to various aspects of life, including the topic of transportation choice. There has been significant research conducted regarding both stress and commute choices. However, there is limited empirical data specific to vanpools. The purpose of this study is to examine whether commuters who utilize a vanpool (VP) to commute to and from work experience less stress than their single-occupant vehicle (SOV) counterparts. Survey respondents provided their personally perceived level of stress both before and after their commute. The results provide insight into the effects of stress when choosing a vanpool as a primary commute mode. This information can help people understand motivating factors that may save time and money, and benefit the environment based on their commute choice.

Key Terms

Vanpool

Carpool

Single-Occupant Vehicle

Transportation Demand Management

Commute

Acronyms

VP	Vanpool
SOV	Single Occupant Vehicle
TDM	Transportation Demand Management
ACT	Association for Commuter Transportation
FTA	Federal Transit Administration
NTD	National Transit Database
TRB	Transportation Research Board
TNC	Transportation Network Company
IRB	Institutional Review Board
SCAG	Southern California Association of Governments
UAA	University of Alaska Anchorage
WHO	World Health Organization

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Background

Vanpools are commonly defined as a group of volunteer commuters who live and work in the same general area and agree to participate in a ridesharing arrangement. Vanpools qualify as public transportation. Public transportation is defined by Congress as, "regular, continuing, shared-ride, surface transportation service that is 'open to the general public or open to a segment of the general public defined by age, disability, or low income'" (Federal Register, 2012). Vanpools, by federal definition, must have seating for a minimum of seven and a maximum of fifteen passengers including the driver. The driver cannot receive any compensation for driving, but the participants can reduce their individual commuting costs by sharing expenses. There are several ways in which a vanpool may be utilized by the general public.

The most common forms of vanpooling are owner-operated, agency provided, contracted service, and privately provided. For owner-operated vanpools a person uses their personal vehicle and performs all of the functions of driving, maintenance upkeep, insuring the vehicle, etc., but only for one vehicle. For each of the other options specific to vanpools, someone is responsible for the maintenance, insurance, marketing, and management of the overall operation. The basic differentiator among the other three types lie in the ownership of the vehicle itself, which then dictates who has responsibility for its service. Under the agency provided scenario, a public transit agency (or the like) owns and operates the service, which is open to the general public. If the public entity decides that they want to provide a vanpool service, but does not want responsibility for the actual capital and or operation, they can choose a contracted service model, in which a private company is contracted to provide the vehicles, service, insurance, etc.

Moving Ahead for Progress in the 21st Century (MAP-21), provides legal and funding authority to the Federal Transit Administration (FTA) to implement regulatory guidance and is the most current transportation reauthorization to date. Under MAP-21, "…Chapter 53 found in section 5323(i). A private provider of public transportation by vanpool is defined as a private entity providing vanpool services in the service area of a recipient using a commuter highway vehicle or a vanpool vehicle" (Federal Register, 2012). When a private entity contracts with a public entity to provide this service, it must be open to the public and adhere to all federal flow-down requirements, such as Title VI (anti-discrimination within the Civil Rights Act); Americans with Disabilities Act (ADA) compliance; the Buy America Act (which dictates which manufacturers are eligible based on steel content), etc. Additionally, there are private providers that operate without a governmental contract, in which case they can provide the service to either the public as a whole, or directly to an individual employer who in many cases prefers to keep its system closed. In any case, each scenario decreases single occupant vehicle trips and improves congestion management for the transportation network.

Exhibit 1 shows that vanpooling is the fastest growing mode of commuter transportation in the U.S. vRide Inc., which has operations in both foreign and domestic markets, is the largest private provider of vanpool services in the U.S. Jon Martz, vRide's Vice President of Government Affairs states: "Unlike other modes of transportation, vanpools saw a retention of ridership even after fuel prices fell following the sharp spike in prices in 2007 as indicated by data in the National Transit Database" (Martz, 2015).

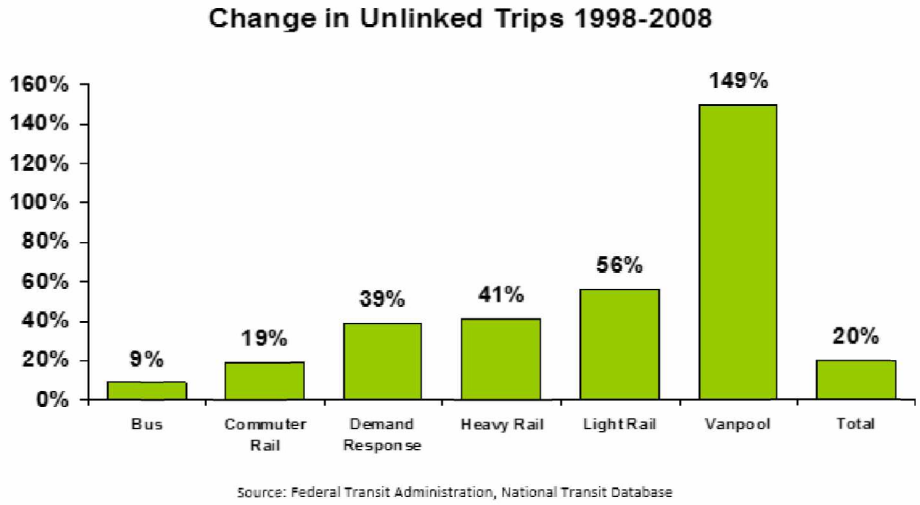

Exhibit 1: Increase in vanpool trips compared to other modes of transit. Source data taken from the National Transit Database (Martz, 2013)

This level of retention might be attributable to a realization of commuters' cost savings over time, or to a better quality of life due to the commute shift, among possible reasons. The retention rate of vanpoolers over time is another reason that studying motivating factors behind commute choice could reveal important information regarding increasing vanpool use. Vanpooling provides a beneficial alternative, but is not without its limitations. Vanpool schedules are not flexible, because the group must agree to specific commute times on the way both to and from work. If there is an emergency during the day, a vanpooling individual does not have their personal car to be able to leave work at a moment's notice. Many vanpool providers mitigate this risk by providing additional services like "Guaranteed Ride Home" programs and the use of rental cars during the workday. These additional services help keep SOV driving at a minimum, while addressing some of the concerns of vanpool commuters and those that might want to participate. Vanpooling as a mode of transportation serves a niche market of consumers whose commute is relatively stable in terms of location and time requirements.

Why is this important?

"Transportation currently accounts for 71% of total U.S. petroleum use, and 33% of the nation's total carbon emissions" (USDOE, 2013, p. 4). Identifying ways to remove potential barriers that prevent individuals from altering their commute behaviour could increase participation. Increasing use of public transportation options could have the potential to lower the need for petroleum and reduce U.S. greenhouse gas emissions. This study attempts to gain a better understanding of one aspect—stress—as a possible motivating factor in mode shift, which is the decision by an individual to utilize an alternative form of transportation instead of using a single-occupant personal vehicle for travel. Stress could be a motivating factor in mode choice. At a minimum, an understanding of the level of stress experienced could be a way to encourage commuters to consider alternative transportation modes.

This study attempts to measure and analyze an individual's personally perceived level of stress before and after their commute, with the commute itself being the only difference independent of mode choice. Not all stress is bad. Stress can be beneficial for some people, under the right circumstances. But, long-term, ongoing high stress levels have been known to cause medical issues. The World Health Organization (WHO) Global Burden of Disease Survey "estimates that by the year 2020, depression and anxiety disorders, including stress-related mental and health conditions, will be highly prevalent and will be second only to ischemic heart disease in the scope of disabilities experienced by sufferers" (Kalia, 2002, p.49). Therefore the purpose of selecting this topic was to understand whether commute mode choice, specifically vanpools, might have an effect on overall stress. This information might be beneficial to commuters as well as both public and private entities including government and businesses.

Insurance companies have a stake in understanding whether a person's commute choice affects their overall health, given the link between stress and health. Casualty and Insurance Edition of Best's Review "estimates that $150 billion of revenue is lost to stress annually in lost productivity, absenteeism, poor decision-making, stress related mental illness, and substance abuse" (Kalia, 2002, p.50). For example, if an insurance company knows that employees with many commute options experience less stress every day, that information could impact (perhaps lower) the premium they charge their enrolees if they choose certain options. If a company is looking for ways to be more competitive among talented applicants, it could choose to offer commute alternatives as part of its benefits package. Likewise, if the company understands how productivity losses, sick days, and work related injuries due to stress affect them, it may consider changes to its commuting plans. The purpose of this research is to establish a baseline data set that can be improved upon in later studies.

Data collected for this research includes surveys administered to companies that have employee access to vanpool service in addition to other forms of public transportation. Types of vanpool programs offered at the selected sites fall into two categories: contracted service as well as the privately provided. Focusing on commutes in different areas of the State of California allowed the study to compare commutes that shared similar issues (congestion, suburban-to-urban and urban-to-urban routes, weather conditions, etc.). In order for the outcomes to have broader

application, the surveys should be administered in other locations across the country to see if the outcomes are consistent. Future studies based on this research are anticipated. Including vanpools as a separate form of public transportation compared to other commute mode options is a public service. Information about stress-related impacts of commute mode can help influence commuters to make choices that work for them.

Topic Choice

Industry Review

The Transportation Demand Management (TDM) Industry focuses on providing transportation alternatives that reduce SOV trips as a way of mitigating congestion and improving air quality. "About 86% of U.S. workers commuted to work by automobile in 2013; 3 out of 4 commuters drove alone" (McKenzie, 2015, p.2). Traditional transportation options have been thoroughly researched over the decades. There is ongoing interest from state, local, and federal government stakeholders in identifying cost-effective ways to increase the capacity of existing transportation infrastructure. In the 2000 study the "State of the Commute" published by the Southern California Association of Governments (the same geographic area covered in this study) reported that in their region "…43% of people said that traffic is getting worse, and 29% of all commuters say that they are personally bothered by congestion." (SCAG, 2000)

The Association of Commuter Transportation (ACT) provides technical support for companies and government entities to support or provide commute mode alternatives. Interviews with industry stakeholders—including private companies, government transportation employees, and board members for ACT—revealed an array of needs for research data in the TDM field. Areas of interest included a variety of topics, including the potential impact of vehicle miles travelled pricing (called congestion pricing) on the transportation trust fund (which is the mechanism through which transportation is funded at the federal level); the reduction realized in emissions savings if bus fleets are changed to electric vehicles; the impact transportation network companies (TNC) have on public transportation usage; and more. Many state and local governments that have legislated future goals for reductions in greenhouse gas emissions also have a vested interest in understanding driver behavior, motivating factors, and choices.

Passenger vehicles represent 36% of carbon emissions (Exhibit 5); so there in an ongoing interest to encourage use of alternative transportation to reduce commute related emissions.

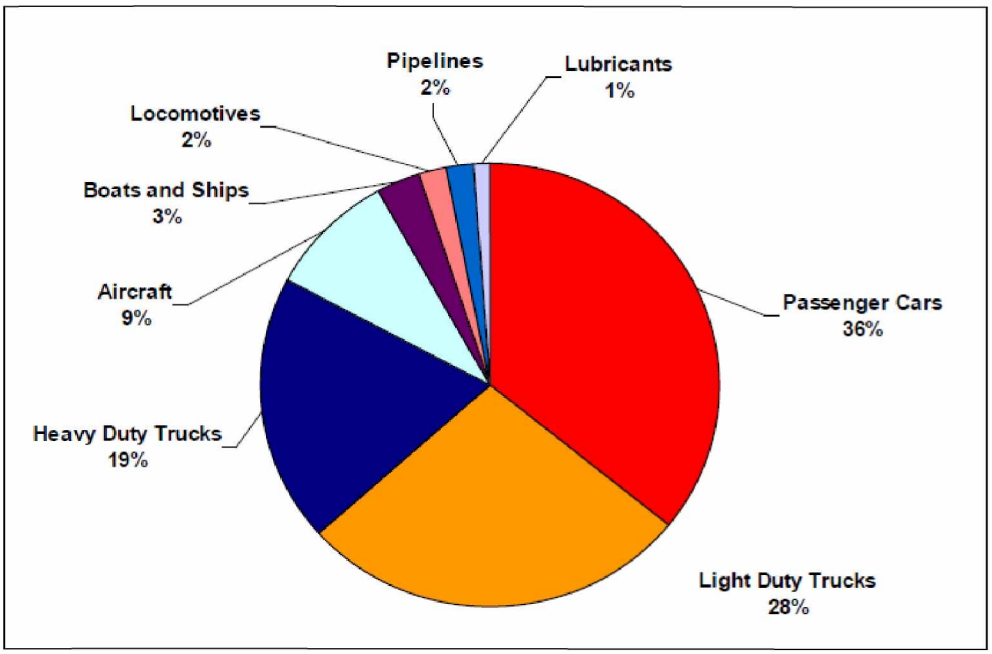

Exhibit 5: Percent of CO_2 from Transportation Sources. Source: (McGuckin, 2010)

After narrowing possible topics to focus on commuter needs, a second set of stakeholders from the Vanpool Council (an interest group within ACT), were interviewed. The second round of interviews narrowed the topic choices to focus on vanpooling. Potential research topics included various facets of commute behavior and included questions about specific personality types that might be drawn to driving a vanpool versus riding alone using a personality assessment tool, the heart rate of commuters depending on mode choice, the incentives that might work best to attract new ridership; and so on. These interviews provided a solid foundation for research that would be meaningful to the TDM community.

Literature Review

A review of existing published literature within the Transportation Research Board (TRB) narrowed the broad field of potential transportation topics significantly, as many of the topics had already been researched. A keyword search on several online research publication repositories revealed a lack of empirical data concerning vanpools as a mode of public transportation. For the most part, vanpool inclusion in publications consisted of general definitions and quotes from private providers of the service. Additionally, where vanpools were included, they were commonly lumped together with carpools— a completely different transportation mode. Carpools are unregulated, receive no

federal funding assistance, and are generally informal with no exchange of money. Carpooling is an important factor in reducing congestion in the US; however, grouping carpool and vanpool data does not deliver the accurate information that transit agencies need to make complete business decisions. As a final strategy to determine an appropriate survey topic, an interview was held with Phil Winters, Director of the TDM Program at the Center for Urban Transportation Research (CUTR) in Tampa, FL. This interview reviewed the feasibility of possible topics as well as the realities of analyzing the data with a very small research group. The final out outcome was a very specific problem statement, hypothesis, and survey methodology that, based on known published data, could provide baseline data for stress levels across different commute modes.

Research Methodology

Initial Application

The survey was designed to deliver initial vanpool data that can be the foundation for future research. The application for approval to begin interacting with the public began with the Institutional Review Board (IRB). Once the determination was made that this research would involve human subjects, a detailed protocol was followed. The review process required a procedure to ensure the data would be kept private and confidential as well as refined the survey questions. The final questions that were approved by the IRB to send to participants in order of appearance in the survey are:

1- I commuted today: (Yes No)
2- For the commute today I was a: (vanpooler, single occupant driver, other)
3- For the work-to-home (or home-to-work, depending on time of day) my level of stress is: (choose 1-10)
4- Gender: (Male or Female)
5- Age: (One of six choices based on generation)
6- My one-way trip in miles is: (one of five options based on distance)
7- For this trip I was a: (Driver, Rider)
8- Do you have any suggestions on the survey experience or thoughts you would like to share from your participation that would be helpful for the researcher to know?

For question one, if respondents did not commute that day, they defaulted to the end of the survey. There is no follow-up question for why they did not commute that day, because it is not pertinent to the data desired for this study. For future research is important to note there could be many reasons for not commuting, which could range from sick, off work, or even working from home; which is commonly referred to as teleworking.

Respondents who answered anything other than vanpool or SOV for question two were also taken to the end of the survey to ensure responses were limited to only those two modes. Between questions two and three, additional

information was given to the respondents to define a common methodology for judging their self-perceived stress level. Questions three and four both relied on the simple understanding of the definition of stress as it applies to this research. The Merriam-Webster definition of stress—"a physical, chemical, or emotional factor that causes bodily or mental tension and may be a factor in disease causation" (Merriam-Webster, 2015)—was given as the baseline explanation for how to interpret commuters' individual level of stress. Additionally, lay language was added to increase understanding. The phrase "in other words, stress is a factor in your daily experience that causes you tension or anxiety and could make you sick" followed the dictionary's definition of the word. Then, each participant was asked "based on that, what is your level of stress for today's commute?"

The respondents could then move to question three which had two parts: an indication of their level of stress before they left home, and an indication of their level of stress after they arrived at work, or vice-versa, depending on whether the survey was administered to morning or evening commuters. Questions four and five are general demographic information—age and gender. Question six asked for the one-way mileage and seven questioned whether they were a driver or rider. Question eight allowed for free form responses and feedback on the survey itself, and yielded interesting information that is outlined in the "Recommendations" section. They were informed that actual quotes could be used in a final publication or in the future, and to mark any comments they wanted to remain confidential. Additionally, it was noted that any comments would be aggregated and not attributed to any individual unless their name was included in the comment. While there were many comments, none of the participants wanted attribution. All additional information, such as the demographic data and trip length, was intended for future analysis. A larger research team is necessary to perform cross analytics regarding interpretation of these results. The scope of this research was limited to the before-and-after self-reported stress levels of vanpool and SOV commuters. The narrow focus allowed for a greater emphasis on the specific hypothesis being tested, delivered significant results, and kept the project scope within the original parameters.

Final Approval

The final IRB approval included revisions to the original proposal. Part of the original IRB application included a statement that employees would be permitted by their employers to participate in the survey during the workday. The final approved version of the submission required that the informed consent document explicitly state this fact. The IRB additionally questioned the use of rewards for participation. The original methodology included the use of prizes that would be awarded to a total of five individuals participating in the entire length of the survey. This was designed as a way to increase the likelihood that individuals would want to register their information daily. The IRB was not familiar with the "level of incentive" that was offered to potential participants. The chosen incentive was to provide one of two items, each with a value of at least $300. The particular items chosen are commonly provided at TDM events as incentives for participation in a larger, lottery-like drawing. Once the IRB understood these to be common tools used in this particular field, the use of the incentives was approved. During the final approval process, an additional question was added and is reflected as question eight. The addition of the final question, which

allowed open-ended responses, permitted a forum to include personal notes and thoughts, yielding additional information (listed in the Recommendations Section) that will enhance the report and provide a basis for future research ideas. The overall evaluation of respondents' statements can also assist in identifying future appropriate employment sites for follow-up surveys based on individual feedback.

The proposal was approved, and the remaining methodologies were executed as designed. An additional research assistant created the formulas that appropriately compiled the data sets into master lists that contained all of the information to run statistical analysis. The plans for involving this individual were followed according to the terms of the approval. The survey information was wiped of all personal data, including IP address, e-mail information, etc. Then an external flash drive was used to house the master file that was clean of any personally identifiable information (PII). The flash drive was hand-delivered to the research assistant with explicit instructions that the data could not be transmitted over e-mail or downloaded to any other device. Once analyzed, the flash drive was certified mailed overnight to the researcher, so that all structural protocols were followed in the execution of the survey as well as the analysis of the final data as approved by the IRB.

Hypothesis

The hypothesis for this study is that commuters who utilize vanpools to get to work will experience lower stress levels than their single-occupant vehicle counterparts. Vanpool companies commonly use the promise of lower stress as a marketing tool and as a way to attract interest. However, that statement is not backed by any particular measurement tool. While vanpool companies measure the satisfaction levels of their users, they likely do not have access to non-users to against whom they can compare that satisfaction. Likewise, the literature review search indicated that they do not have any statistical analysis of stress experienced by either vanpoolers or SOV drivers to know if this statement is true.

The outcome of accepting the conjecture could provide useful information to potential vanpoolers in making a more informed decision regarding their commute mode choice. It could be helpful for everyday commuters to know, based on their individual goals and their ability to choose to vanpool, that their stress levels might be statistically lower than their SOV counterparts. The outcome of rejecting the hypothesis could provide the companies that offer these programs an opportunity to review their operating strategies. If their goal is to lower users' stress, follow-up research could be initiated to determine specific causes of commuter stress. If stress is not a factor at all (no statistical significance), vanpool companies may decide to alter their marketing strategies to focus on other topics that are of more benefit to the users. Either way, the outcomes of the analyzed survey results provide empirical evidence of the level of stressed experienced by users. Ultimately, individual users need to make informed decisions that are best for their overall needs. The outcomes of this research may assist in their ability to make that choice, but is not intended to act as the final word, because users may not see stress as a reason to choose either mode, a decision that may be based on other factors entirely.

Analysis Tools

Qualtrics™ has a robust reporting feature that gives graphical representations of the data that is collected. However, due to the ongoing collective nature of the surveys, it was more feasible to compile results into a Microsoft Excel™ spreadsheet for analysis. Each individual survey was downloaded from its individual submission date, wiped clean of the personally identifiable information (PII), and then aggregated according to survey type (morning or evening). Once the individual site information was inserted into individual Excel spreadsheets, descriptive statistic information was derived utilizing the Excel add-in. The descriptive statistic data was then used to perform confidence intervals that included paired data, independent means with population variances, as well as proportions that assumed the sample sizes were appropriate.

Survey Methodology

Survey Design

Determining appropriate survey tools

There are many ways to measure stress. Devices exist that can be worn throughout the day and measure blood pressure (a common indicator of stress) and are small and lightweight, which minimize any impact on the wearer's day. Mobile applications can track a number of health-related data, all of which can be indicators of stress levels as manifested through personal health information. Specific to this project, there were a number of concerns with ensuring the privacy of individual health data. The research team consulted with the stakeholder group mentioned earlier and decided that a more appropriate measurement tool for this specific research would be the level of stress with which the participants self-identified. Using a scale of one defined as "no stress" to ten defined as "high stress," individuals could report their personally perceived level of stress, or the level of stress they were "feeling" at that point in time.

The commercially available products that measure these health metrics range from $50-$500 depending on choice of equipment and model. There is also medical diagnostic equipment that can be used under the care of a physician, which would cost considerably more to utilize. The established budget did not allow for the purchase of these tools, especially considering the number of respondents projected to participate. If desired, these tools would be helpful in the future for follow-up research, as a way to confirm the level of stress with which the user self-identified. They could also be used to measure stress as a function of the respondents' health data, a measure of which the individuals may not be fully aware. These factors confirmed the need to request stress levels as a personal experience, as reported by the individual, as qualitative data.

It is recognized that there can be many factors that affect stress during the commute time. These factors could include traffic, knowledge of impending events later in the day, workload, concerns at home, etc. The purpose of this survey structure is to determine, even *with* all of those factors, whether the type of commute mode traveled facilitate a statistically different stress level as determined before and after the commute. All statistic methodologies used are to measure the *change* in stress from before the commute and after. Under this methodology the reasons for being stressed are not of concern. Most of the stresses experienced by an individual would be experienced regardless of commute choice; for instance: both SOV drivers and vanpool commuters experience traffic, although to different levels and in different ways.

All participants were given the same definition of stress each day to provide an equal frame of reference for how to define stress over their day. Each survey was administered for a full 14 days. Given the self-reporting nature of the data, it could be argued that there are individuals that would rate stress significantly different in either direction than others. The longitudinal nature of the study was designed to minimize any potential for bias in the data due to these potential individual differences.

Using a Scale of One to Ten

Hospitals use a numeric rating scale (NRS) during triage of incoming patients as a methodology for assessing patient symptoms The Joint Commission on Accreditation of Healthcare Organization is an independent, not-for-profit entity that accredits and certifies thousands of healthcare organizations throughout the U.S. They published a study that confirmed the reliability of the NRS for patients and went further by stating, "For adult populations the JCAHO recommended the use of the ten-point NRS" (Baharuddin, Mohamad, et al, 2009, p.19). The NRS provides patients with a common methodology to attempt to explain their individual level of pain to their nurse or attendant on a self-reported scale of one to ten. It is used widely and recommended within the study as a way to create a clearer picture of overall wellness "...asking for pain scores is a very important step toward excellent and comprehensive pain management in Emergency Medicine" (Baharuddin, Mohamad, et al, 2009, p.21). The concept behind the methodology for this vanpool survey was chosen due to the recommendation that self-assessment can be an appropriate measurement tool for respondents.

Stress Data Comparisons

The ten-point scale is used in multiple settings in addition to hospitals, including by the American Psychological Association (APA) in their annual report, "Stress in America"™. For this annual study, the scale allows respondents to report their individually perceived levels of stress in different aspects of their lives "on a scale of one (little or no stress) to 10 (a great deal of stress)" (Anderson, Belar, et al, 2015, p.8). Similarly, this vanpool commute-centric study defined the one-to-ten scale as one (no stress) to ten (high stress). Findings within the "Stress in America"

report support the rationale of utilizing individually perceived levels of stress to be used as an appropriate measurement tool, as reinforced over the long term of the reports (as reported annually, and across the nation from 2007-2014). Further, the APA stress report found, as Exhibit 6 shows, that when "comparing East, Midwest, West and South regions, Americans report similar levels and sources of stress. Regardless of where they live, Americans' experiences with stress appear to be similar" (Anderson, Belar, et al, 2015, p.14).

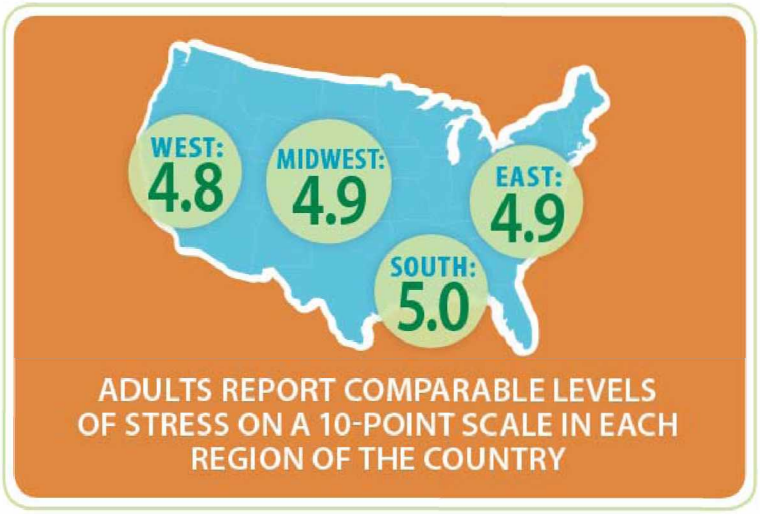

Exhibit 6: Average stress level by region of the U.S. Source: American Psychology Association: Stress in America p.14

This would indicate that the realized levels of commute-specific stress, as measured in this State of California-executed study, could mimic potential findings in other areas of the U.S. Confirmation of comparable levels would be further justified in future research, to see whether results are replicated across other areas of the U.S.

There is a broad space that different individuals can use to determine their individually conceptualized levels of pain/stress. It is common knowledge that there are individuals with inherently higher or lower levels of tolerance. There could also be explanations for people who are injured to report a lower level of pain due to a previous experience that was more painful. For this survey, and to minimize bias due to individual differences, the overall average over the full two-week period was used to determine the descriptive statistics used later to determine the mean as determined by performing confidence intervals (explained in detail later). The response rate for the weekends was much lower than the weekdays and therefore only the weekday data was used for statistical analysis. Using the long-term average, the individual differences between people who may report ongoing levels of stress higher or lower than the normal average ends up meaning less within the data as a whole. The long-term average should be used in future follow-up surveys to determine whether there are any differences in the same survey set if only one day is used for survey implementation. To derive the baseline data expected from this research, the

longitudinal study maximizes the likelihood for statistically-valid data while minimizing the potential for bias in the individual self-reporting.

Research Administration

For each individual site, the informed consent letter was sent to the population one week in advance of the first survey being sent. This allowed for proper review of the consent page, and an opportunity to ask the research team questions. The surveys began the following Monday and were sent at five a.m. and five p.m. each day for the 14 day period. Each survey sent reiterated the date and time for that particular survey, along with any additional information required, or brought to light based on the participants' comments from the day before. There were a few submission issues experienced at individual sites, the effects of which are described below.

Survey Research Tools

Survey Medium

After the survey questions were developed, a crosscheck was performed to ensure the questions were appropriate to the intended outcomes, and to make sure they were easily understood by common commuters. Draft versions of the questions were sent to colleagues and industry experts. Experts familiar with the locations where the research was intended to take place suggested a change. The original survey questions included a set of commonly-used interstates that would be the typical ingress and egress for the home and/or work commute. A stakeholder suggested that instead of naming specific highways, it would make for a more appropriate apples-to-apples analysis to instead list mileage categories. Longer commutes vs. shorter commutes could be eventually be cross-referenced to determine the levels of stress experienced by each length of commute. Though not part of this study, this was a good suggestion for future analysis of the data to derive more information when breaking down each dataset. This change to the project scope was accepted and the survey was finalized for content.

After determining content, an appropriate survey tool needed to be selected to administer the survey. Ideally, during project initiation all stakeholders decided it was preferable to perform the survey via a mobile application to keep the data as fresh as possible, and potentially attempt to increase participation due to ease-of-use. There are readily available applications, both free and paid, that administer mobile versions of surveys. Ideally, the best mobile application option would allow the participants to take the survey without having to download any new app in order to do so. The intended vision was to locate such a program that would send participants text reminders to fill out their daily information, with the form accessed through a link provided in the text.

It was known that not all participants would have a smartphone with internet access, therefore a standard web application would also be necessary, and both versions would have to deliver the same aggregated data results.

During the IRB process it was identified that these open source applications did not have a methodology for ensuring the data retrieved would be kept confidential and private to the level required for University of Alaska-sponsored research. In the interest of saving time in the IRB approval process, the research team made the determination to utilize the Qualtrics online survey tool to administer the survey. Qualtrics does have a mobile application through which users can submit surveys; however, the specific design of this survey would not have translated well to the mobile platform, and therefore it was not used. Draft surveys were sent in separate test groupings first to colleagues, then to the industry stakeholder group, and finally to the subject matter experts (SME), including professional researchers. Once they confirmed that the survey was easy to follow, simple to execute, and ready for distribution, each of the selected sites were contacted and dates were set to administer the study.

Survey Implementation

Site Selection

The scope of work dictated that this baseline research be limited to employers in the State of California. This choice is intended to allow for consistency among the respondents. Commutes in California are very different from commutes in the Midwest, Northeast, etc. To set an accurate baseline, it is important to ensure the respondents are experiencing *approximately* the same issues during their commute. California commutes are universally congested, especially in the cities—specifically the employment centers where the research was targeted. The surveys were performed electronically at employers in the cities of San Mateo, Los Angeles, and San Francisco, California. Locations were chosen based on the potential for cooperation by an in-house administrator; population size (medium and large employee sets); and existing vanpool users. The selected sites each have a large number of vanpool commuters, which would contribute to an appropriate mix of vanpool and SOV respondents.

The sites that were initially selected based on this criteria were Los Angeles World Airport (LAWA), Cal Tech University, and Jet Propulsion Lab (JPL). Realized risks (explained later) during the execution of the surveys required additional identification of new sites. The sites added later in the project were LinkedIn and Intuit. These sites each met the criteria for a willing site administrator, and all have existing vanpool participation. Each of these locations is within a city in the State of California.

Understanding the Results

Each of the individual result sets had a total number of people who signed up during the informed consent period. However, on any given day, fewer than the total number of people that registered actually submitted their survey information. It is also important to note that an individual could take a vanpool one way and a bus the other way, or any other number of choices based on their daily routines. Overall, there was a slightly lower response rate for evening information than there was for morning information, which is why the data is reported in aggregate form as

well as by individual site. Each day respondents were asked to proceed with their surveys only if they actually commuted by one of the selected modes. This means if they used any other mode (such as bus, carpool, etc.), that information is not logged in this dataset because these respondents were taken to the end of the survey. The ability to choose "other" is also why the totals for percentage of SOV and vanpool vs. the total number of responses do not add up to 100%. Additionally, it is acknowledged that stress levels may differ for the vanpool group between drivers and riders. For the purpose of this study, all vanpool data is aggregated regardless of participation type. Future analysis of the dataset should separate out these data points to further clarify stress levels between drivers and riders.

Limiting this information was intentional, both as a way of controlling the scope of data to be reviewed and to focus on only the vanpool and SOV commutes. Therefore, on any given day the number of respondents fluctuated based on the mode choice they used that day. For purposes of comparing the data, the average number of respondents was used for the length of the study for the morning report, and separately for the evening report. There is potential for bias in the data because the total number of responses for any given person will not be 14. However, as a way to minimize this issue, the survey was administered for a total of 14 days as a way to increase the likelihood that individual responses would be repeated a number of times and maximize the opportunity for highly reliable data.

The individual results simply give information on the implementation experience at each site. It also includes minimal data that relates to the total number of respondents. Analysis of the site-specific data can be found later in this report. Each site observed a significant drop in the number of total respondents for both the vanpool and SOV categories on weekends. The drop in responses was common at each site. Of the respondents who did report on Saturday or Sunday, there were times when only one or two individual responses were logged. If the data were analyzed in that manner there would be weighted bias in the outcome of the individuals who did log any data on those days. In order to keep the dataset more reliable, the Saturday and Sunday responses were removed entirely, and instead analysis was performed only on days one through five of each survey week. Many work locations have schedules that operate seven days a week, and therefore all weekday as well as weekend data was intended to be included. Future follow-on research could identify in advance if a seven-day schedule is common before requiring those dates in the response set. All outcomes list days one through ten for surveys, which correlate to Monday through Friday of both weeks studied.

Execution Special Note

The first site, LAWA, noted a 9/80 work schedule, which requires employees to work nine hours each day but gives every-other Friday off. The other sites did not specifically mention this schedule. However, the second Friday of each of the remaining surveys had a much smaller response rate than all of the other weekdays in the survey set. It is possible that the other sites also had a portion of their employees that are offered a 9/80, also called a "Compressed Schedule". On each of these dates, the individual results were compared among the individual respondents and the responses were similar. Also, the percentages of SOV versus vanpool ratios were also similar to the rest of the

responses. Therefore, the second Friday is averaged with the same weight as the other daily responses, as the weight of that change will be the same among all survey sites.

Individual Site Information: Los Angeles World Airports™

Los Angeles World Airports (LAWA) was the first survey administration site. One hundred eighty-seven employees signed up during the informed consent period. LAWA's employees were highly engaged throughout the process. On average, there was a total of 88 responses in the morning and 84 responses in the evening. The percentage of vanpool responses in this total was 25% on average for both the morning and evening. The percentage of SOV responses was 68% in the morning and 69% in the evening. Overall, the percentage of responses was the same from the morning to the evening. During survey analysis, LAWA was able to confirm the percentage of the sample of SOV and vanpool participants was consistent with their population. The second Friday of the LAWA response set reflected a drop in the total number of vanpool responses and a smaller drop in the total number of SOV responses. This is due to the type of schedules worked at LAWA. The 9/80 schedule is a common tool in the transportation demand management toolkit.

The comments section at the end of the survey designed to inform the research team of any issues with participants' experience was used to provide additional insights of their specific commute issues. The comments and suggestions would be useful in future reviews for follow up research topics. On day one the surveys were sent as expected. On day two the lead researcher received e-mails from a number of participants that they had not received their surveys. LAWA's site contact researched internally to determine if the issue was due to a firewall problem after the first day, when the potential for the high number of e-mails could have created the impression of mass spam being sent to employees. During survey design, this issue was identified and efforts were made to mitigate the issue. LAWA's IT Dept. responded back to the site contact and determined that the issue was not on their side. This process took most of the day.

Once it was confirmed that the issue did not originate within LAWA's servers that evening, the lead researcher made contact with Qualtrics to determine what the issue might be. A discussion with a few representatives from Qualtrics revealed an issue with outgoing messages. Because the University of Alaska Anchorage (UAA)'s account with Qualtrics provides that the surveys are sent from UAA's servers, the Qualtrics analysis showed that UAA was not sending the surveys as scheduled. Qualtrics contacted their technical advisor at UAA and discussed the issue. UAA explained that they would be updating their servers and that the issue preventing the e-mails from being sent could take up to two weeks to resolve. Due to the timed nature of the surveys, the research team could not wait for two weeks to restart. Instead of cancelling the survey, Qualtrics provided a separate account from which all of the surveys could be sent, and which would not fall under the UAA e-mail system. This was not resolved until 8 p.m. on the second day of the surveys.

In the meantime, communication was sent to all participants that reminded them to simply log their stress levels separately, and once the system was back up and running, new links would be sent to bring the survey up-to-date. The ultimate impact of this issue was a one day delay on the day-two surveys. On day three, all participants were sent survey links that specifically outlined the day and time that particular link was for, and of the written responses received, all respondents indicated that the interruption did not inhibit their survey submission. Though this information is important to note for complete transparency of the execution of the first survey, any impact on the data itself is negligible, and the numbers reported are reflective of the same responses for the rest of the survey per individual. The resulting data set remains highly reliable and statistically valid.

Individual Site Information: California Technical University™

California Technical University (Cal Tech) was intended to be the second survey site. The week before the lead researcher scheduled the informed consent to be sent, the site administrator was unable to identify a methodology to send the survey invitation to their employees while excluding the students. During the institutional review board (IRB) process, it was specifically stated that students would be excluded from the surveys. Because there was no way to send the e-mail and ensure that students did not sign up for the survey, it was mutually decided to not include Cal Tech in this study. The actual measurement is to understand the difference between *commuters*, and even if students are traveling to and from school once a day, their lifestyle is very different from employees' and therefore should be excluded from the results. All transit behaviors should be measured, analyzed, and understood. This particular analysis specifically excluded those types of trips (school trips) from participation. Therefore, the survey was not sent to Cal Tech, and an alternate survey site was identified.

Individual Site Information: Jet Propulsion Laboratories™

Jet Propulsion Laboratories (JPL) is the site of the third survey. The site administrator there confirmed its ability to participate, and sent the invitation e-mail to all employees. During the informed consent period, 24 people signed up to participate. In advance of sending the day-one (1) survey, the site administrator was contacted to make sure that 24 respondents represented a good sample size for JPL's population; the site administrator stated it was not. They further explained that they just finished their own in-house commute survey the week before, and JPL employees were likely experiencing survey "burnout,". The administrator expressed interest in being included in future surveys and was supportive of the intent of this particular research. No surveys were sent to this group of employees, and therefore the ratio of vanpool to SOV participants that registered is unknown.

Individual Site Information: LinkedIn™

LinkedIn was selected after Cal Tech was removed from the survey set. The original project required that survey administration occur with at least three employers. The project further detailed that at least two of the sites

demonstrate statistically viable data, which is defined as an average response rate representative of the population as determined by the site administrator, prior to data analysis. During the informed consent period, 130 individuals signed up. A daily average of 42 individual responses were registered. Of the morning responses, an average of 8% of the total responses were from vanpoolers, whereas 66% were SOV commuters. The evening commutes registered similar data: 9% of the total were vanpoolers and 63% were SOV commuters. By day three it was clear that of the total number of respondents registered, only a handful were vanpoolers.

The much smaller ratio of SOV to vanpool responses could be cause for concern. Contact was made with the site administrator to determine if this was an appropriate sample. The site administrator stated that the ratio of vanpool to SOV commuters was definitely representative of LinkedIn's overall population. The ability to vanpool to their campus was relatively new, and they were very interested in the outcomes of the survey results. When asked if the overall sample set was representative of LinkedIn's population the site administrator informed the lead researcher that due to company policy they were not able to give a total number of employees at any particular location. But, they could relay that the average daily number of responses were on the higher end of surveys LinkedIn had administered itself. The administrator also stated that the number of surveys received had been used in the past to make business decisions. They concluded that they were content with the sample size, and wanted to continue with the research participation.

Statistically reliable datasets was a requirement of the original project, therefore another survey site would need to be identified so that there was an increased likelihood that the results would be statistically reliable. The question of sample size, in addition to the question of appropriate ratio, makes this data set initially unreliable. An analysis of the totals would need to be performed to see if the results revealed any statistical significance. If not, the data could be used to see if it resembles the averages of the other two data sets as a way of duplicating the process. This could not be addressed until the data sets were statistically analyzed. There were no further incidents in the administration of the survey.

Individual Site Information: Intuit™

The time allocated to survey administration was quickly coming to a close. The amount of time left did not leave room for a response set that did not reflect the population. Before the informed consent letter was sent to prospective respondents, the statements of "I am a Vanpooler" and "I am an SOV" were moved to the informed consent document. This made the mix of respondents clear before the survey was administered. The closing of the informed consent period reflected a mix of 12% vanpoolers to 88% SOV commuters. The site administrator was contacted to confirm whether this was representative of their population. They confirmed it was close to the population representation. They added that their vanpool ratio was plus-or-minus 10% for vanpoolers, depending on the location. Previous surveys in this study all had a lower response set on any given day than the number of total registrants in the informed consent period. Only the analyzed data could confirm statistical relevance.

The site administrator felt that the number of registrants represented an appropriate sample size. By the close of the surveys, surveys averaged 66 respondents per day. Of the daily responses, 10% were vanpoolers, and 76% were SOV drivers, making the overall averages representative of the population of the chosen site, as confirmed by the site administrator. There were no issues with the surveys being distributed or filled in. There was however, an anomaly within the survey itself that was not noticed until this round of surveys.

Notice of Anomaly

The draft version of the survey was sent to 20 transportation demand management (TDM) colleagues in one set, and well as 10 non-TDM individuals with various levels of education. These initial test respondents were instructed to read through the survey and make sure it made common sense. For industry experts, this was a way to make sure the survey was structured properly to achieve the results the professional stakeholder group expected. The second test was to make sure the terms used would be easily understood in lay terms by individuals without any experience in the TDM field. Additionally, the draft was reviewed by University professors with experience in administering surveys. The first two surveys sites, LAWA and LinkedIn, were executed as planned and their individual experiences are reported above. During the third administration of the survey, executed at Intuit, two individuals noted in the comments section that for the question "On a scale of one to ten, what level of stress are you experiencing…" there was an option of selecting the number six (6) twice in the listed succession. The view that the respondents showed gave them a choice using a slider bar to sweep to highlight the number that was appropriate to them. The numbers as they showed on the screen were 1,2,3,4,5,6,6,7,8,9,10, with the number that respondents selected shown to the right of the slider. As the second day's surveys were sent this error was acknowledged, and respondents were provided with instructions to simply choose the number that fit their perceived stress at that time, ignoring the duplication. No edits were made to the survey to correct the anomaly, and all of the subsequent surveys were sent without further comments about the duplicate six.

Consultation with several professional researchers revealed this anomaly to be a very small concern. Each explained that the brain typically processes information the way it knows the information should be presented. In this case, since the instructions clearly stated "on a scale of 1-10," the people taking the survey likely only saw the information that their brain was already expecting, which would have been the consecutive numbering without duplication. One researcher used the term "pattern expectation" to explain how it is possible, though an extensive search did not reveal a precise medical term for this phenomenon, which is demonstrated in one's inability to proofread original material, as the brain knows what it was meant to say, instead of what is typed on the page. Qualtrics could not explain the anomaly. A review of all previous drafts and executed copies of the surveys confirmed that the anomaly existed in each of them, with no other reports of it being an issue. Possible explanations could be that respondents saw the problem and it did not bother them; it did not register in their mind to report it; or they simply did not see it. No follow-up questions were sent to the participants to address this matter. The same

survey was previously sent twice a day to two sites for two entire weeks, and only at the last site did it come to light, as reported by only two participants. A detailed analysis of the stress levels chosen revealed that the number 6 was chosen only 5% of the time in the reported data. The daily averages revealed that no group's average in any category was at a level of 6 or above, further limiting any potential statistical doubt of the data.

Outcomes

Healthy Stress Levels

The American Psychological Association "Stress in America" study shows that: "in 2014 the Average American level of stress is 4.9 on a scale of 1-10. The level of stress that those same individuals felt on average would be a healthy level of stress is 3.7" (Anderson, Belar, et al, 2015, p.9). Exhibit 7 depicts these differences.

Exhibit 7: Average stress levels reported by year. Source: Anderson, Belar, et al, 2015, p.9

This would require a reduction of 1.2 points, a 24% reduction of their stress level, to achieve what respondents perceive to be a healthy amount of stress. What combination of changes would account for that much change to achieve the targeted stress level? It would appear that there is an opportunity to assist in identifying ways that the average American could reduce their levels of stress. Utilization of vanpools or SOVs appears to be a contributing factor to either an increase or decrease in stress level. Further research is necessary to identify if these results can be replicated against other modes of transportation. As an overall goal of making healthy choices, determining a commute choice that supports stress reduction would be a good strategy.

Individual Site Outcomes

All visual representations of the results are truncated to preserve space and reflect a scale appropriate to the data. The stress level is based on a scale of 1 – 10. No average stress level was above the 6 -mark. Therefore, the scale that is used to reflect the changes is based on a 1 – 6 level so that the changes are more easily identified. For each statistical analysis performed on the datasets, only the first dataset, which was for the morning vanpool both before and after commutes, did not reflect a statistical significance. The overall outcome for this result is reasonably explained by inferring that the commute itself does not have any statistical impact on stress levels for those participating in vanpool, neither increasing nor decreasing stress level.

LAWA

LAWA's commuters experienced different levels of stress before and after their commutes based on the transportation mode chosen. On average, vanpoolers reported a stress level of 2.64 before their commute and 2.84 after their commute. This was a 7% increase in stress. Confidence intervals performed on this dataset infer this difference to be statistically insignificant. Based on that outcome, though the numbers are slightly different, it appears that the commute had no statistically significant effect on the stress level. The SOV commuters, on the other hand, had a very different outcome. The SOV commuters reported an average stress level of 2.41 before their commute and 3.13 after. This was a 23% increase in stress level for just the morning commute. The vanpool commuters saw a 7% decrease in their stress level from before to after their commute. The SOV commuters reported an 8% increase in their stress level from the time they started their commute to the time they got home.

The data implies that not only is there some difference in stress that can likely be associated with the commute itself, but that commuters who drive themselves have overall higher stress levels due to their commute. Exhibit 8 demonstrates the findings.

Exhibit 8: The overall averages of the vanpool and SOV commuters at LAWA for both the morning and evening commutes.

LinkedIn

LinkedIn's outcomes were similar to those reported at LAWA. There was an exception with the morning commutes, in that the changes in stress level for both groups were statistically significant. The morning vanpool averages were 3.15 reported before the commute, and 3.74 after, which is a 15% increase in stress level at the end of the commute. The SOV averages for the morning commute were 3.16 before, and 3.83 after, which is a 17% increase in stress level. These results suggest that both commutes increase stress level with the SOV mode having a slightly higher percentage of stress experienced after the commute. The main similarity among all sites surveyed is within the evening commutes. The evening vanpool before-commute stress level was 4.93 while the after-commute stress level is 4.19. This *reduction* in stress level is a 15% decrease between when they left work and when they arrived home that night. The SOV commuters, on the other hand, experienced higher levels of stress after their evening commute.

The SOV evening average is 3.83 at the start of the commute and 4.1 at arrival home, which equals a 6% increase in stress attributable to the time between work and home. The findings are graphically illustrated in Exhibit 9.

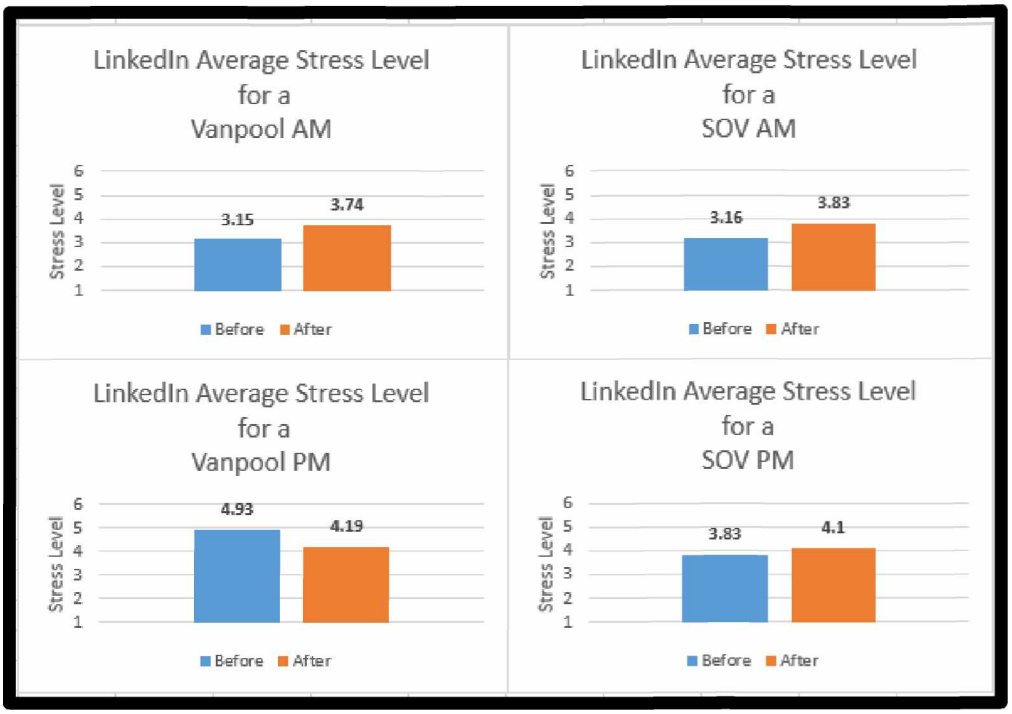

Exhibit 9: The overall averages of the vanpool and SOV commuters at LinkedIn for both the morning and evening commutes.

Intuit

Intuit's morning responses reflected slightly different outcomes from the other two sites. For the vanpool morning average, the reported before stress level was 3.59 and the after is 3.32, a 7% decrease. Though this represents a slightly lower level after the commute, this difference is not statistically significant. Alternatively, the SOV morning averages mimicked the results of the other sites. The morning before-commute and after-commute stress levels were 3.25 and 4.46 respectively. This change represents a 27% increase in stress between leaving home and arriving at work to start the day. The evening results reflected the same findings as the other sites. For the evening commute, the vanpools had results similar to the other sites, with a before-commute average of 3.82 and an after-commute of 3.29, which decreased respondents' stress by 13%.

The SOV counterparts experienced an inverse increase in stress: respondents' before-commute stress level was 3.91 while the after is 4.56, ultimately increasing their stress by 14% for the evening commute. The findings are represented in Exhibit 10.

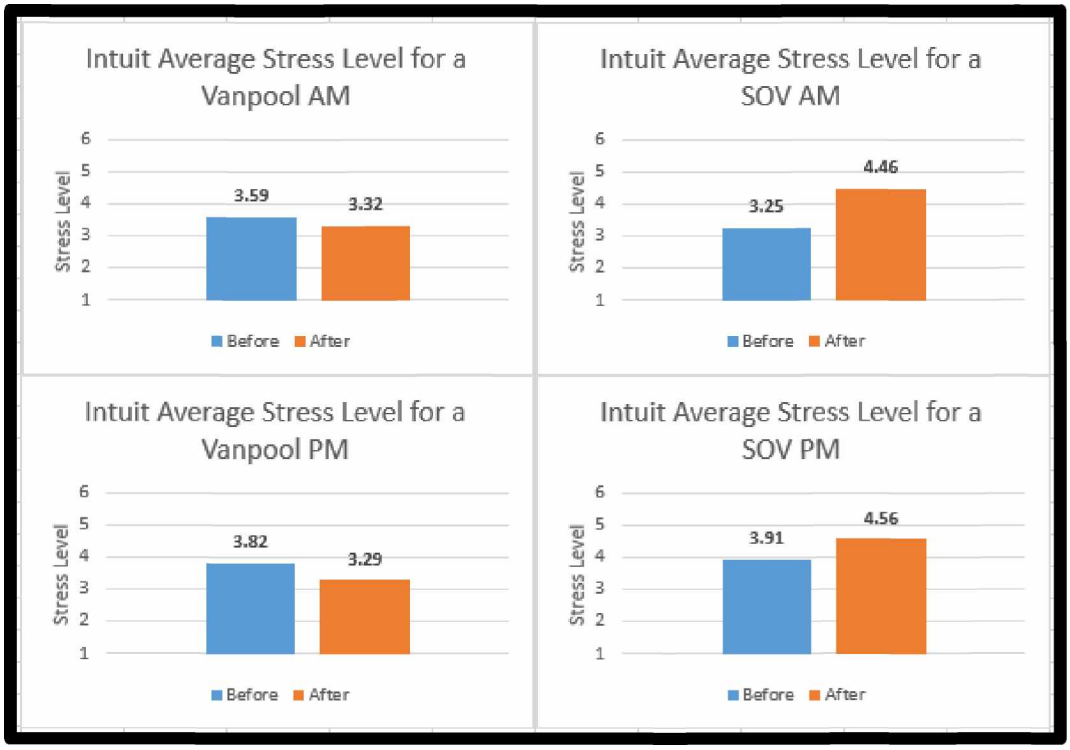

Exhibit 10: The overall averages of the vanpool and SOV commuters at Intuit for both the morning and evening commutes.

Summary Findings

High-Level Findings

This study hypothesized that commuters that utilize a vanpool (VP) would experience statistically significantly lower levels of stress than their single-occupant vehicle (SOV) counterparts. Confidence intervals (CI) estimate the mean of the dataset using the desired level of confidence coefficient, which in the case was chosen to be 95% (CI95). After performing several confidence interval analyses and reviewing the descriptive statistics (as well as other statistical tools) the data analysis outcomes support the hypothesis. Each statistical tool answered specific questions relating to the data itself, and including CI for paired data, independent means assuming population variances, and proportions. There were 5,515 individual responses received, including the morning and evening

commutes. The possible responses included a choice of "other" if something other than vanpool for SOV was used, in which case respondents were automatically taken to the end of the survey. In all, 1,986 individual surveys were analyzed for the morning commute and 1,813 individual surveys analyzed for the evening commute. Exhibit 2 demonstrates the percentage of commute type used for data analysis.

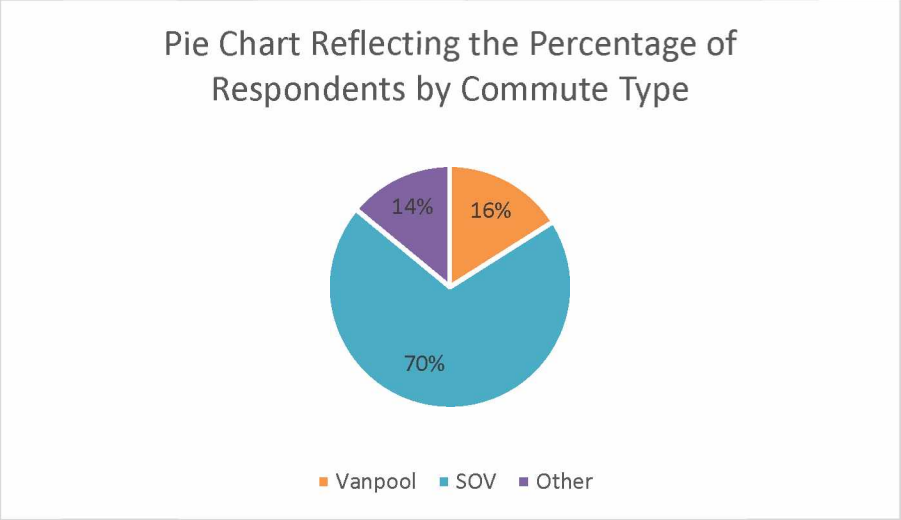

Exhibit 2: Percentage of respondents grouped by type of commute mode.

These averages are consistent with the anticipated average SOV versus vanpool commuter as reported by each survey location chosen. The formal conclusion of this study is that the null hypothesis is rejected in favor of the claim that SOV commuters have higher levels of stress than VP commuters after the commute in both the morning and the evening. The statistical tools and tests utilized to analyze the data support the finding that overall vanpool stress levels are lower than the SOV stress levels. The resulting data did not show a normal distribution, however, the vanpool data is consistently to the left of the SOV data. Since the data was not normally distributed non-parametric tests (Wilcoxon Rank Sum Tests) were run in addition to the parametric confidence intervals. The non-parametric results reflected p-values that were near zero which indicate that the original parametric method was appropriate, as well as simpler to express in the findings. All confidence intervals assume the samples reflect the population. There is no indication that they do not. The findings suggest a link between choice of commute mode and overall average stress level.

Exhibit 3 illustrates that over the term of the study, vanpool commuters reported 21% less stress than the SOV commuters on a daily basis. Breaking down that number, vanpoolers reported a 5% decrease in stress, while the SOV commuters reported a 16% increase in stress, which is a combined total of a 21% difference.

Exhibit 3: Visual representation of overall stress reduction findings from study.

On average, vanpool commuters were shown to have a slightly higher (though not statistically significant) level of stress than their SOV counterparts before the commute. However, by the end of the commute the same group reported a statistically significant lower level of stress than its original score, and a significantly lower reported level of stress than the SOV commuter group. The evening commute vanpool participants showed a (statistically significant) higher stress level before the commute compared to the SOV participants, which actually lowered after the commute. Conversely, the SOV commuters stated a lower level of stress than the vanpool commuters before their commute, and as expected in the hypothesis, experienced a higher level of stress at the end of their commute.

Exhibit 4 shows the relationship of stress levels reported before and after each commute type.

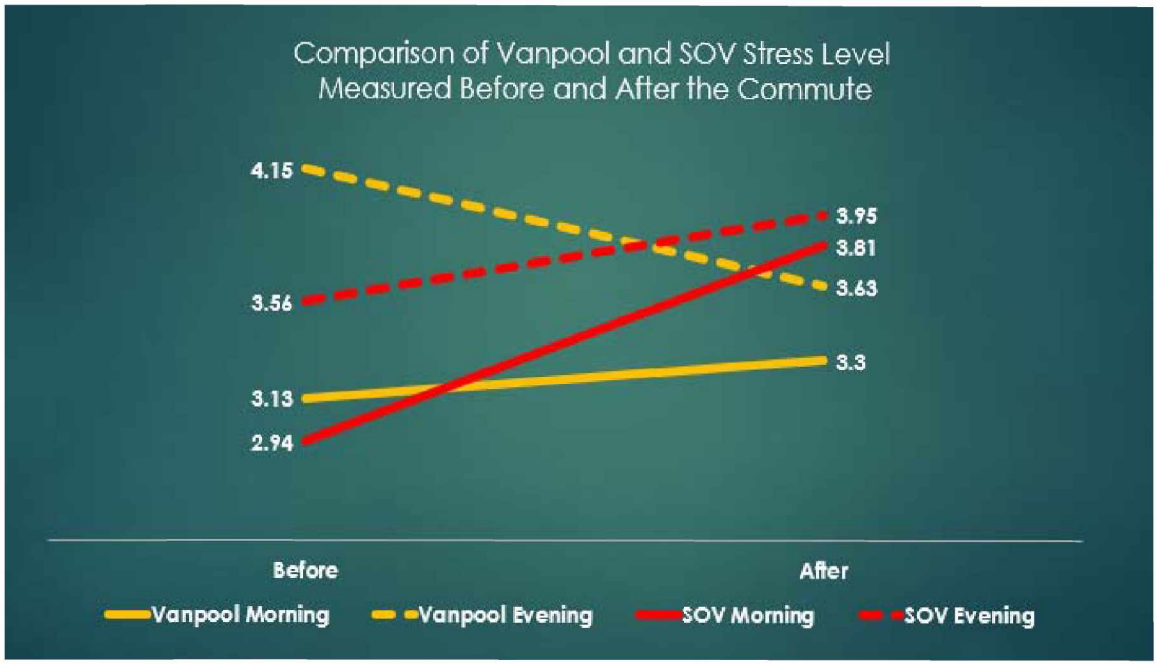

Exhibit 4: Comparison of stress level organized by mode choice and time of day. (Truncated for comparison only, actual scale was from one to ten.)

These findings support the outcomes from the confidence intervals and show a correlation between the data, with the only change occurring over the period of time being the commute itself. These findings support a relationship between commute choice and stress level. The data reveals a logical association between commute and stress levels, with vanpoolers experiencing lower levels of overall stress compared to single-occupant drivers as a result of their commute choice.

The Fine Print

Aggregated Data

The three sites produced individual data outcomes. To determine the overall results for this study, the aggregate data files were compiled by including all data, without regard to site, into a single file and then analyzed. The data was separated only by commute mode and time of day. These aggregated files included only information for the VP (Vanpool) and SOV (Single Occupant Vehicle), all separated into morning and evening and before- and after-commute. All demographic and other related data included in the survey was not analyzed for this study, because it was intended to be reserved for future studies.

The hypothesis was to determine whether vanpool commuters experience lower overall stress levels than their SOV counterparts. In order to determine this, all datasets required a specific equation to determine this level of stress. For the purposes of this study the equation to determine the difference in stress between modes is:

VPB - VPA = Δ Stress
SOVB - SOVA = Δ Stress

VPB = vanpool [before] and VPA = vanpool [after], while SOVB = SOV [before] and SOVA = SOV [after]. The subtraction for the delta calculations is always before-commute self-assessed stress minus after-commute self-assessed stress. To understand results, a negative delta means that stress increased. A positive delta means stress decreased. Hence, an increase in stress produces a negative value.

The equation for determining the overall difference in stress level is:
<Stress - >Stress / <Stress = Δ (expressed as a percent)

Such that:
If the >Stress is also [B] then the Δ is *lower stress*
If the > Stress is also [A] then the Δ is *higher stress*

To support the findings listed in "Why Save the Best for Last," the data is:

VPB	VPA	SOVB	SOVA
3.64	3.47	3.25	3.88

$|VPB - VPA| / VPB = .046$ (5%) *lower stress*
$|SOVA - SOVB| / SOVA = .16$ (16%) *higher stress*
The VP is a 5% decrease
The SOV is a 16% increase

Confidence Intervals (CI)

The first methodology applied to the dataset (CI paired data) was used to determine whether there is a statistical difference between each mode-specific user group before and after their commute, with respect to both the morning and evening commute. The same people assessed themselves before and after the commute, therefore allowing for a degree of control over the variability of the results. For the morning commute, VP equaled no statistical difference between average stress levels before and after. The level of stress experienced before the commute remained the same at the end of the commute. SOV equaled on average (.69-1.04)CI95 more stress on the scale after the commute

than before. For the evening results both modes showed a change before and after in slightly different ways. VP = an average (.25 to .74)CI95 change reporting *less stress* upon arriving home than when leaving work. The commute appears to play a role in the reduction of stress when using a vanpool. SOV = an average (.25 to .54)CI95 *increase* in stress after arriving home than when leaving work. Hence, the commute for the SOV group had a higher post-commute stress level, while the VP group experienced lower levels.

The second methodology applied to the dataset (CI independent means with different variances) was used to determine if there was a statistical difference between VP and SOV with respect to the *delta* in stress levels before and after their respective commutes. It acknowledges that there will be an expected change in stress for either method, but answers whether one mode has a greater level of change over another. The morning results show average stress levels were greater (.4 to 1.0)CI95 for SOV than for VP. Though both methods indicated an average increase in stress, the SOV commutes produced a greater differential. As in method one, method two reflected major differences in the evening data. Average stress level changes were greater (.66 to 1.18)CI95 for SOV than VP. Both indicated an average increase, but the SOV mode produced a greater differential in stress. Interestingly, the VP mode reported that on average, the VP commuters ended their commute with lower stress than when starting. This reiterated previous findings.

The third methodology applied to the dataset (CI independent means with different variances) compared the actual self-assessed test scores rather than the changes in stress levels between VP and SOV. This measured the statistical difference between "before" commute for both VP and SOV. It would indicate whether there is one group that is inherently more prone to stress than the other, hence any differences that could be attributed to lifestyle rather than the commute. For the morning results there was no statistical differences before the commute between VP and SOV. Both types had the same initial stress. After the commute the SOV has between a (.14 and .88)CI95 greater average self-assessed stress level than the VP counterparts. For the evening commute the "before" level of stress comparing the modes showed that VP showed a (.18 to 1.00)CI95 average higher stress level. This result is counterintuitive. A possible explanation could include anxiety of the impending commute to be sure they get to the van on time for departure. Further research would be necessary to explain this higher stress level at the end of their day. The "after" commute data reflects no statistical difference between the modes. This may appear strange, however there are reasonable explanations to explain this result. The first findings show a higher initial stress level for VP that appears to be overcome by the commute itself. The higher initial result appears to either mitigate stress for the VP while increasing for the SO as the commute progresses. Looking back on the data from the second methodology applied, it appears as though a combination of decreased stress for the VP and an increase in stress for the SOV produces the result. It should be noted that the average difference for VP shows a .52 differential *decrease* in stress between the start and finish for VP. Conversely, there is an average .40 differential *increase* in stress for the SO commuter. Vanpool is the only group to show an actual decrease in stress level as a result of the commute.

The fourth methodology applied to the dataset (CI proportions) asked what the differential in proportion between VP and SOV was, with respect to the before- and after-commute delta of the stress level. No additional stress or a reduction in stress would be data of importance. Only the delta with respect to no change, or reduction from pre- as well as post-commute is counted to determine the proportion between the two groups. Morning results show an average of (18 to 55%)CI95 VP users had either no change in stress or reduced stress compared to their SOV counterparts. For the evening, there is an average of (47to 85% CI95) VP users who had either no change of reduced stress levels compared to the SOV.

The fifth methodology applied to the dataset (CI proportions) ignores any difference between the morning and evening commutes, and determines the overall difference in proportion between VP and SOV with respect to commute stress. This is a combination of all the differential data. A negative score means that stress increased. A positive score means that stress decreased. A zero score means there was no change. The positive and zero scores were counted for the VP and SOV groups using 60 as a divisor (total count). On average, between (37 to 66%)CI95 VP users had no change in stress or reduced stress compared to their SOV counterparts.

Performing five different confidence intervals was a way to ensure the individual actions were replicating results of the overall findings. This is the methodology that was used to ensure the data was reliable and the results reflected consistent findings. The mean identified through the descriptive statistics was then used to compare the high level findings and reflect the actual reduction (as observed in the vanpool results) with the increased stress level (as observed in the SOV results).

Overall Study Observations

The evening commuters appeared to be better with regard to stress than the morning commuters. Future research should focus on explaining a commuter's ability to handle stress at the end of their day better than at the beginning of it. The only category of commuter that resulted in less stress after their commute was the evening vanpool group. All other categories showed an increase in stress after the commute. It is important to note that in the morning although all categories reported an increase, the vanpool data did not reveal as much of an increased stress level. All confidence intervals are 95% intervals. Other than the "within VP and SOV CI," all other applied methodologies were conducted assuming unequal population variances.

Understanding the motivating factors behind mode shift and providers' ability to market to those lifestyle needs should be a goal of transportation providers. Consequently, there should be a vested interest from the federal government in understanding how to increase multimodal usage among commuters. Commuter use of alternate transportation modes for even a few days a week would create significant savings in both greenhouse gasses as well as in the annual budget connected to infrastructure maintenance.

Exhibit 11 demonstrates the reduction in personal spending focused on fuel alone as a result of increased adoption rates among various transportation modes.

Table 6: Key Outcomes with Moderate Adoption (5% of Population)

	Annual VMT (billions)	Annual Fuel Spending (billion $)	Annual GHG Emissions (million tonnes)
Baseline annual values (with no action taken)	2,047	$386.1	971
Increase transit use by 8 trips/month	–15.2	–$2.9	–7.2 (–0.7%)
Switch to all carpooling commutes	–49.9	–$7.0	–23.4 (–2.4%)
Telecommute 1 day/week	–10	–$1.9	–4.7 (–0.5%)
Increase trip-chaining	–13.6	–$2.6	–6.5 (–0.7%)
Move closer to work	–22.8	–$4.3	–10.8 (–1.1%)

Table 7: Key Outcomes with Higher Adoption (10% of Population)

	Annual VMT (billions)	Annual Fuel Spending (billion $)	Annual GHG Emissions (million tonnes)
Baseline annual values (with no action taken)	2,047	$386.1	971
Increase transit use by 8 trips/month	–30.4	–$5.7	–14.4 (–1.5%)
Switch to all carpooling commutes	–99.8	–$14.0	–46.8 (–4.8%)
Telecommute 1 day/week	–20	–$3.8	–9.4 (–1.0%)
Increase trip-chaining	–27.2	–$5.2	–13.0 (–1.4%)
Move closer to work	–45.6	–$8.6	–21.6 (–2.2%)

Exhibit 11: Projected outcomes after adoption of alternate commute options. Driving Commuter Choice in America (Perks, Raborn, 2013 p.11)

For the purposes of this study, using the carpool information would closely relate to vanpool savings. VMT reduction would have an impact on federal spending, while savings in fuel would translate to key individual savings. Each of these are reasons why ongoing studies that relate commute choice with aspects of overall life could provide key insights to increase mode shift. This was the intent of this study.

Recommendations

The comments left by the participants delivered compelling information, and could be used as a starting point for future or follow up research. Some of the comments included:

- Even though riders do not have to drive, there is stress due to the other people you are riding with [in a vanpool].
- There are no buses that can take me [to] a meeting place where vanpools originate.
- There are not enough vanpools for people who work a 9/80 shift.
- I commute outside of the regular commute window to avoid the high stress [SOV commuter].
- My issue [with] driving myself is the cost of wear-and-tear plus gasoline for my personal car, but there are no vanpools that match my commute time.
- I had a dentist appointment this morning so I did not commute as usual. I try to combine trips when possible.

- I work nontraditional hours, from 6:30 p.m. to 10 a.m.
- The City of Los Angeles should consider a program wherein it facilitates the transfer of employees who are able to and would like to work in City departments that are closer to their homes… For instance, I live 30 miles away from LAX and would like to take a lateral position at another City Department in Downtown Los Angeles (which is 13 miles from my home), but have been unable to locate a position. Such a coordinated program would help reduce emissions and employee stress levels, and potentially result in greater employee productivity.
- The rigidity of a vanpool schedule makes it difficult to commit to one, but if there was other (more direct than a bus) transportation that had different travel times, I would be willing to use other forms of transportation.
- I arrive at work 30 minutes before my scheduled start time to minimize stress.
- Sometimes, thinking about what needs to be done at work brings the stress level up a bit on the way to work. Today, traffic on the way in was decent and I was a vanpool rider so that was good. I couldn't do the drive every day into work. That would be too stressful. I am thankful for the vanpool that LAWA provides.
- There's not much we can do to improve the experience. Bottom line is, the commute time is just too long, but there's no way to go around it when you're commuting from San Francisco to Silicon Valley. I wish there were a solution—maybe it will get better when we have flying cars.
- Knowing the start time and end time of the driving would probably be relevant to the research, as well as if there were any abnormality such as road construction, road closure, etc.
- My commute would be better if: the roadwork on 101 would be complete. The roadwork has been going on for about three months or more. Also, the empty Google buses make no sense to me. One passenger in a large bus, really?
- Carpooler and I had conflict...so I had to drive in alone.
- As a recent transplant to the Bay Area, the traffic here is nothing like other states. My commute actually gives me more anxiety than my work [does]. My last commute was the same distance [but it took] half the time and never gave me anxiety.

Many of these comments were repeated amongst the respondents, and the above does not provide an exhaustive list of all comments and recommendations. However, future research would be enhanced by reading through the comments and suggestions. Some of the individual comments, especially the one referring to a relocation program based on commute for lateral moves within a company, could be an interesting starting point. In some cases, it would create even more questions upon which future studies could be designed.

Closing Remarks

The purpose for this study was to determine if the hypothesis, that vanpool commuters have less stress due to their commute choice, is accurate of not. A large part of the strategy behind implementation of the project overall was identifying an appropriate measurement tool for measuring stress in commuters. Previous research (for other purposes) has relied on the scientifically accepted, frequently used ten-point scale, as provided in the referential studies. The results presented within this study accepted the conjecture using the methodology developed under the project process. In the future, if a more appropriate tool is identified, these results should be used as the baseline dataset to further refine empirical research of vanpool as a commute mode. The many questions raised as a result of this study, such as "what other contributing factors could explain the difference in stress before and after the commute?" or "will other modes of transportation reflect similar reductions?" etc. reaffirm a need for ongoing research in commuter decision processes. Understanding the underlying factors that allow certain individuals to choose one transportation mode over another can assist the transportation demand management field in making educated choices for their service networks. This study provides a unique perspective into potential (perhaps even unrealized) motivating factors for vanpoolers as well as single occupant drivers.

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List of Exhibits

Acknowledgments

Thanks to the Project Management Department faculty that agreed to serve on my committee; Roger Hull (primary advisor), LuAnn Piccard, and Dr. Seong De Kim. Your contributions to this research enhanced the final product. Special thanks to Gary Kretchik for his commitment to assisting my understanding of the statistics necessary to properly analyze and present the findings. My interest in research began in your class, and I am very proud of how much I have learned in a very short period of time. I would also like to thank Jack Gallagher for his assistance in aggregating the large data files thereby keeping the project on schedule. Thank you to Jill Ivey for editing the final draft within a short deadline. Ricardo Caligagan provided assistance on the final graphic for the high level findings, and the assistance is greatly appreciated.

I would be remiss if I did not also thank vRide Inc. especially Ann Fandozzi and Jim Kessler for allowing me the separation and autonomy to complete this research and further the vanpool body of knowledge while still funding the incentives provided to winning respondents. I would like to acknowledge all of my colleagues within the field of transportation demand management for their assistance in narrowing down the topic choice and acting as the test group for the survey. Lastly, thanks to Jon Martz, Devon Deming, Phil Winters, Eric Goldstein, and Luanna Huber, all whom participated in this research project as my external stakeholder group. You are each great mentors and provided valuable input and guidance to me as I completed this research that I hope will be meaningful to our field of work.

Vanpool Research Project

PM686B CRISSY DITMORE NOVEMBER 30, 2015

Agenda

- Project Overview
- Vanpool Definitions
- Project Monitor and Control Outcomes
- Selected Knowledge Areas
  - Scope Management
  - Communication Management
  - Stakeholder Management
- Survey Outcomes
- Questions

Meet Crissy…

Crissy Ditmore
Account Executive
Western Region

Crissy has 10 years of experience in the field of Transportation Demand Management as an employee of vRide

Recognized in by the industry in 2011 as their "Emerging Leader". Expertise in federal working practices (FTA, FHWA, DOT, etc.) and regulatory framework surrounding public transit with a specialty in vanpool programs.

Direct responsibility for a portfolio of large and small scale projects to manage teams and deliver successful contract projects in the public and private arenas.

Today's takeaways:

Conjecture: Vanpoolers will have lower levels of stress than their SOV counterparts.

Project: Well articulated plan, executed according to the plan, and monitored and controlled to successful project and product outcomes.

Conjecture Accepted

Project Scope

This project is to plan, execute, and analyze the results of a survey for vanpool and single occupant vehicle commuters. The survey will consist of questions that relate to general commute and demographic information as well as self-reported levels of stress as observed before and after the commute. The final deliverable will be a formal document of the research and observed outcomes with the intention of publishing the data to enhance the vanpool body of knowledge.

Research Scope

A comparative analysis of vanpool and single occupant vehicle commuters' self-reported stress level before and after the commute

- Qualitative Research — Self Reported data
- Descriptive Statistics — For further analysis
- Confidence Intervals — Interval estimates of the mean

Economic Impact of Stress

Casualty and Insurance Edition of Best's Review states that:

"…$150 billion of revenue is lost to stress annually in lost productivity, absenteeism, poor decision making, stress related mental illness and substance abuse ." –Kalia, M.

Assessing the economic impact of stress– the modern day hidden epidemic http://www.ncbi.nlm.nih.gov/pubmed/12040542
Eleseiver Science © 2002

The Right Research, Right Now

- Culmination of 2 years of industry requirements research
- Consulted CUTR, ISER, Mobility Lab, TRB, UCLA Research, etc.
- Surveyed Vanpool Council for narrowing field of topics

- Industry dissatisfied with amount of publically available vanpool specific research
- Interested in having more to offer prospective customers in value statement
- Interested in vRide leading the charge for research

What is a vanpool?

- Each van has a volunteer driver/coordinator
- Groups of 7 to 15 share the cost of the van lease and fuel, based on van style/size and commute miles
- Consolidated billing including vehicle & fuel card
- Insurance, maintenance & repairs provided
- 24-hour roadside assistance & emergency ride-home program

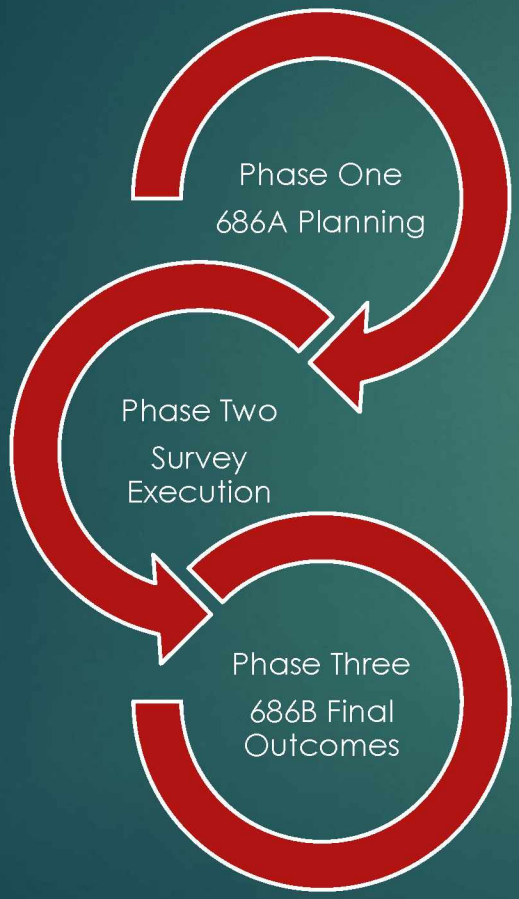
vRide by the numbers...

Each year, vRide's 6,000 vanpools yield:*

- ✔ 350,000 tons CO2 emissions avoided
- ✔ 20 million fewer commuter trips
- ✔ 9.5 million fewer cars on the road
- ✔ 900 million reduced miles
- ✔ 36 million gallons of fuel saved at a value of $126 million
- ✔ 473,000 parking spaces saved

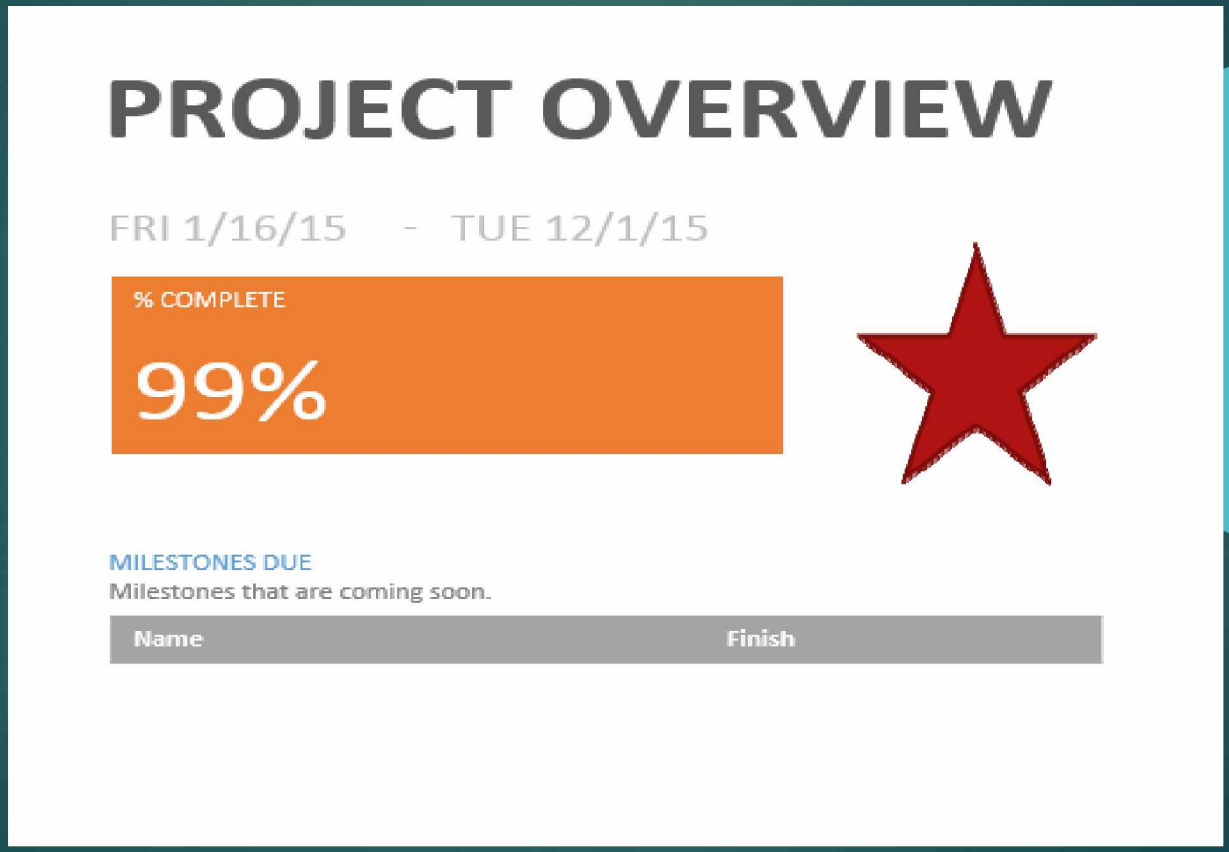
*vRide 2011

Project Timeline

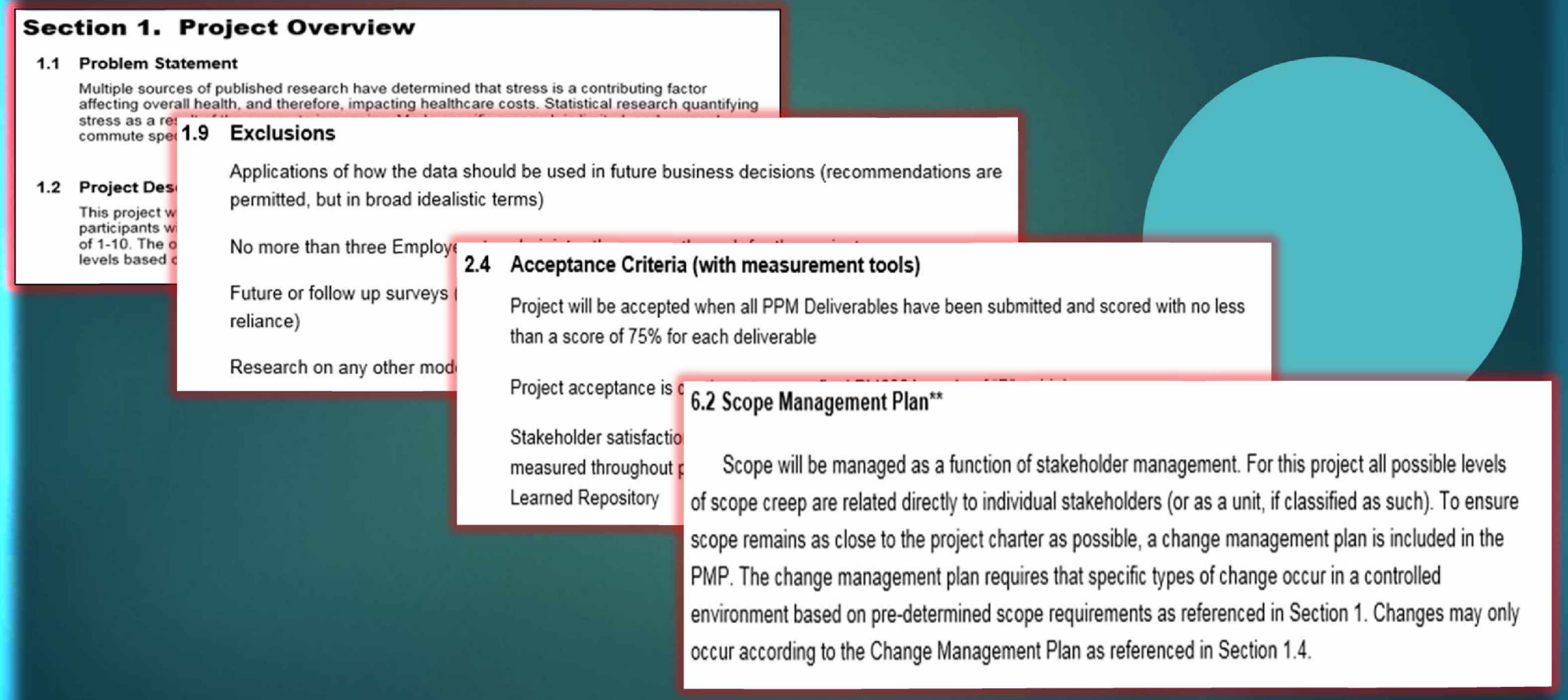


- Phase One Jan-April
- Phase Two May-August
- Phase Three Sept-Dec

CPI: 1 Since Beginning of Phase 3



Project Management Plan



Section 1. Project Overview

1.1 Problem Statement

Multiple sources of published research have determined that stress is a contributing factor affecting overall health, and therefore, impacting healthcare costs. Statistical research quantifying stress as a re
commute spe

1.2 Project Des

This project w
participants w
of 1-10. The o
levels based o

1.9 Exclusions

Applications of how the data should be used in future business decisions (recommendations are permitted, but in broad idealistic terms)

No more than three Employe

Future or follow up surveys
reliance)

Research on any other mod

2.4 Acceptance Criteria (with measurement tools)

Project will be accepted when all PPM Deliverables have been submitted and scored with no less than a score of 75% for each deliverable

Project acceptance is

Stakeholder satisfactio
measured throughout p
Learned Repository

6.2 Scope Management Plan**

Scope will be managed as a function of stakeholder management. For this project all possible levels of scope creep are related directly to individual stakeholders (or as a unit, if classified as such). To ensure scope remains as close to the project charter as possible, a change management plan is included in the PMP. The change management plan requires that specific types of change occur in a controlled environment based on pre-determined scope requirements as referenced in Section 1. Changes may only occur according to the Change Management Plan as referenced in Section 1.4.

Control Scope

ID	Change Log ACCEPTED
C1	2.10.15 Phil Winters* final review of survey questions in advance of submitting for IRB approved. [Corrective Action] *If Phil Winters is unavailable, Eric Goldstein may serve as substitute, but one or other must approve before submissior
C3	3.18.15 A third company was added to the number of survey sites to be administered to minimize the potential for A site not delivering statistically sound results. [Repair Action]
C4	7.15.15 Realized Risk R4, implemented response strategy to increase the number of survey sites to increase Responses until a statistically viable data set is achieved. [Corrective Action]
C5	9.1.15 E. Goldstein suggested narrowing the problem statement as well as the Abstract and remove the references to comparing the outcomes to health related outcomes in order to leave enough room to more effectively report out the data as observed in the final deliverable. [Corrective Action]
C6	10.1.15 After reviewing the response rates it was disc Much lower than during the weekdays. After conferrin Ignore all responses from the weekends and not inclu Executed according to the plan, and making this chan Change was accepted. [Repair Action]

	Change Log UNACCEPTED Must give rationale
C2	2.25.15 L. Huber suggested including carpool data in the survey as there would likely be more carpoolers than Vanpoolers to respond. UNACCEPTED. At this time inclusion of carpoolers is outside of the scope and is not a change the PS is willing to accept. Added to the lessons learned log for future use in follow up research. [Preventive Action]

Constrain Scope
Enhance Cost
Accept Schedule

Control Communication

vRide

COMMUNICATION LOG

Project Title: Vanpool Research Project **Edit Date:** 11.21.2015

Notes gathered from the stakeholder meetings throughout the project Started 2.5.15 as a result of Knowledge Area Performance factor criteria. Use to judge satisfaction from stakeholders active in the process. All members listed have granted permission to record the status updates and consequent actions. Only Level 1 and 2 stakeholders will have notes taken, unless project history would benefit from the note.

LAWA 6.1.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 6.8.15 – 6.21.15**
Cal Tech 6.15.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 6.22.15 – 7.5.15** **UPDATE:** They could not find a way to send informed consent to employees without sending to students. PM decided to cancel this as a survey site, Realized Risk R4, implemented response plan according to PMP.
JPL 6.29.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 7.6.15 – 7.19.15** **UPDATE:** it was clear that there would not be enough people participating to deliver statistically valid results. R4 response plan was already implemented and continued to determine new sites. Contacted JPL again to discontinue survey.
LinkedIn 7.13.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 7.20.15 – 8.2.15** **UPDATE:** Response set is low and is questionable if the mix will deliver statistically valid data. PS requested a fifth survey site to be sure.

Control Stakeholders

Vanpool Research Project

Stakeholder Register

nation		Assessment Information (Their project requirements and expectations)					Classification (Their rel impact	
Role	Contact Information	Major requirements	Measures of Success	Expectations	Primary Concerns	Other helpful info	Classification (1-consult, 2-inform 3-consider)	Current Level of Support
Project Sponsor	ann.fandozzi@vride.com	Vanpool Based Research to begin vRide's provision of empirical data to the industry.	Execution and acceptance of Project by PM686A, ability to continue with other aspects of job, achieve vRide goals in addition to project goals.	Completion of research in 2015 to have data to present in 2016 at relevant conferences	Current customers are not affected by this additional work, expansion and growth for contracts is sustained	Organizational restructuring underway (private) must keep those aspects and deadlines in mind, and alter the project	1	Approves project resources as necessary to meet project and organizational goals.

- All stakeholders interviewed to determine communication needs and project requirements
- Possible project opportunities and threats identified to enhance risk register identification and create plans to mitigate scope creep
- Baseline satisfaction level determined to track through project. Surveys administered to high level stakeholders to measure satisfaction

Lessons Learned Repository

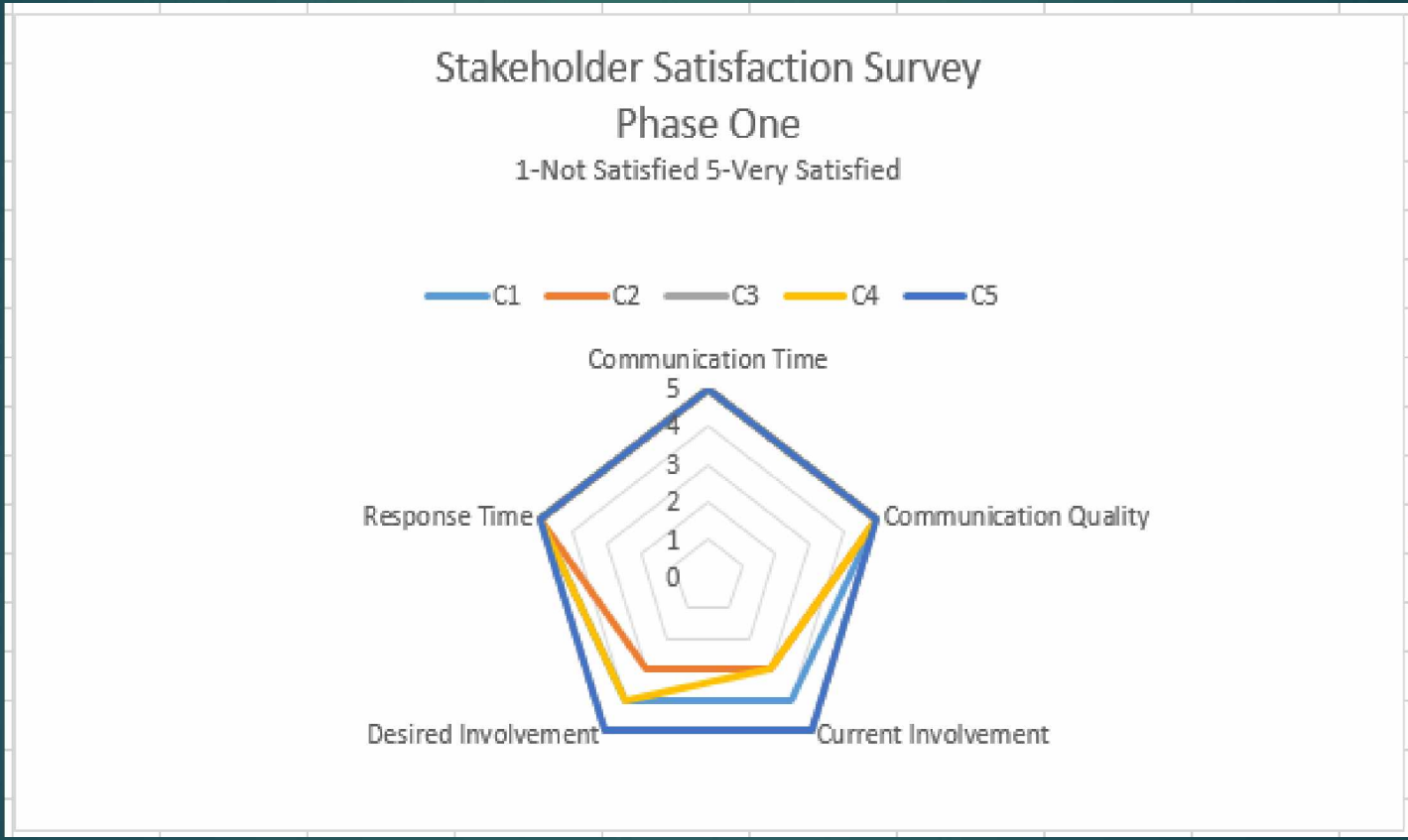
Realized Risks and Issues

ID	Risk or Issue Description	Response	Comments
R4	*Low Survey Response Set*	*Identification of new potential survey sites for follow up surveys as planned in the PMP.*	*Risk 4 was realized during the second scheduled survey.*

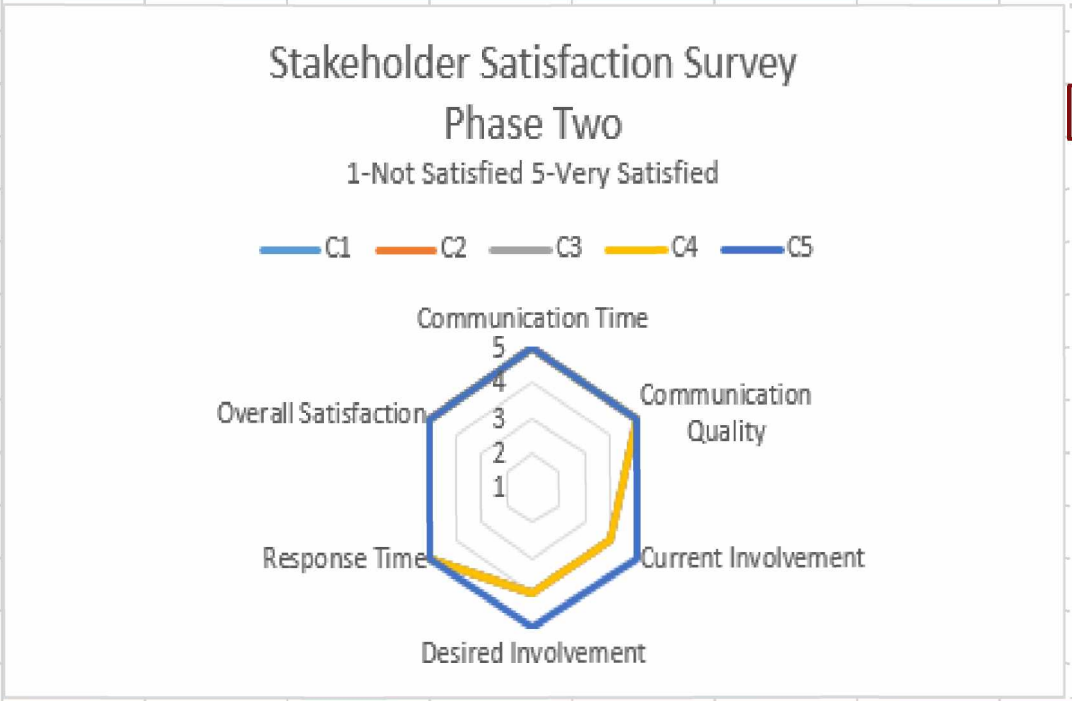
Risks not identified in PMP [UNKNOWN REALIZED RISKS]

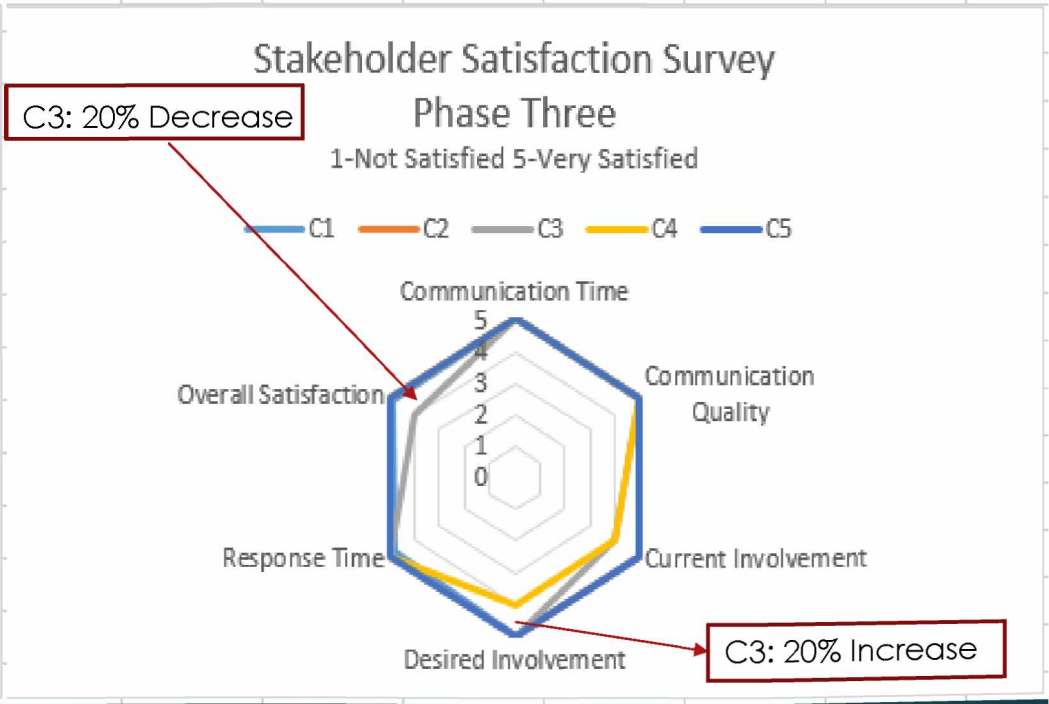
ID	Risk or Issue Description	Response	Comments
U4	*Editor Late*	*The first editor was not making any progress on the final revisions, and therefore it was necessary to identify a new one, and require a quick turnaround. This set back the original schedule by a week and left the committee members with little time to review.*	***The initial PMP did not determine the editor not sending the paper back in time as a risk, and it should have been. Any part of the project not directly in your control should carry some level of risk, and then a backup plan would have been identified in advance instead of at the last minute. This delay resulted in dissatisfaction among the committee members near the end of the project unnecessarily.***

Knowledge Area Measurement



Knowledge Area Measurement





You helped keep me on track with what you needed and when you needed it. I especially appreciate your enthusiasm and passion for your project. Makes serving on your committee a pleasure.

Monitor and Control Outcomes

vRide

LESSONS LEARNED

Realized Risks and Issues

ID	Risk or Issue Description	Response	Comments
R4	*Low Survey Response Set*	*Identification of new potential survey sites for follow up surveys as planned in the PMP.*	*Risk 4 was realized during the second scheduled survey.*

Risks not identified in PMP [UNKNOWN REALIZED RISKS]

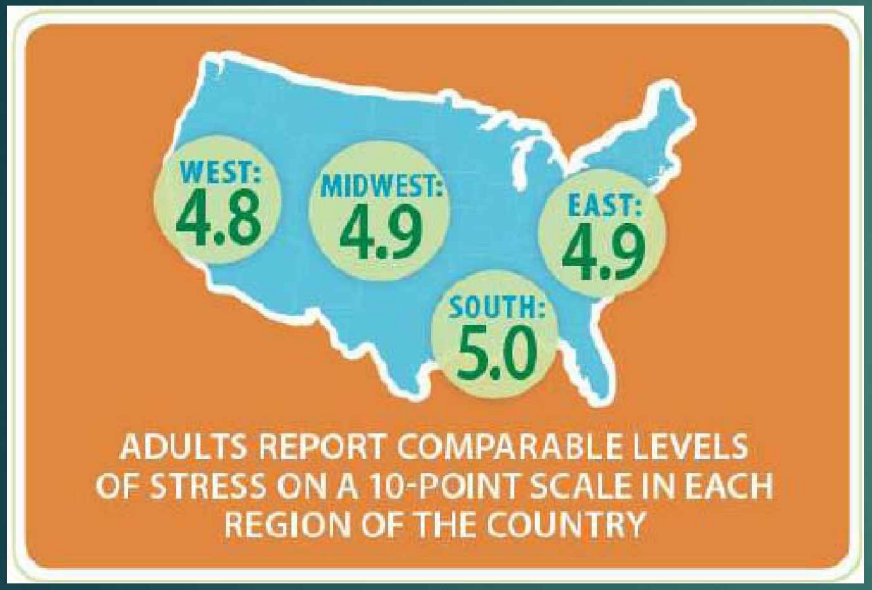
ID	Risk or Issue Description	Response	Comments
U1	*Unbalanced mix of control population*	*Follow up surveys administered to maximize potential for statistically valid information.*	*A different version of this risk was identified in the early planning documents. That other risk was also realized, but this one needed to be mentioned separately because they are two separate issues,* ***and this one was not accounted for in the initial risk assessment.***
U2	*UAA IT issues*		

Stakeholder Requirements outside of Scope

Log for new stakeholder suggestions that are not part of current scope, but could be part of future research

Stakeholder	Description	Comments
L Huber	*Wanted to have carpool respondents participate*	*While not part of the scope of this project, future inclusion could reveal additional data of interest.*

Research Methodology



Source: American Psychology Association "Stress In America" p.14

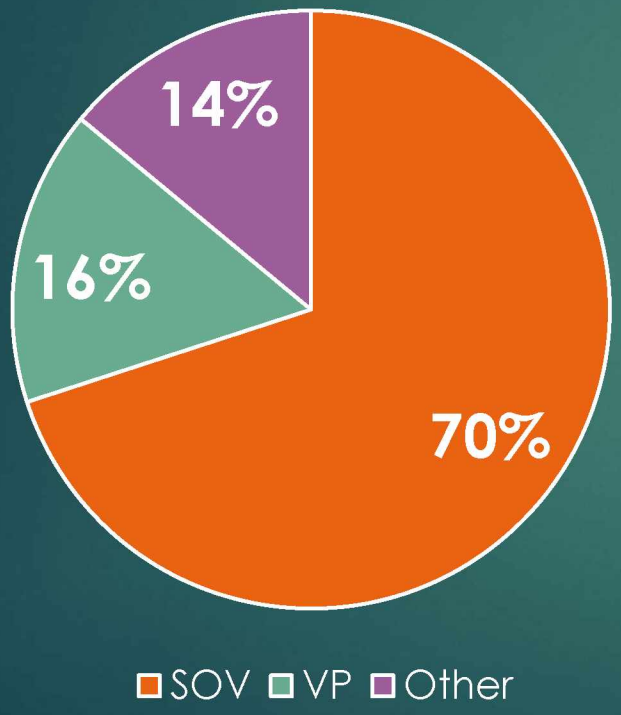
- Self reported stress level
  - 1 = No Stress
  - 10 = High Stress
- Survey delivered at 5am and 5pm for 14 days to measure stress level before AND after commute
- Measuring the CHANGE

Survey Execution

- Cal Tech:
  - [R4: Low Response]
  - Potential IRB violation
  - No action taken, alternate site identified
- JPL:
  - [R4: Low Response]
  - Survey "Burn Out"
  - Cancelled before day one
- LinkedIn and Intuit added as sites

Survey Response Data

Pie Chart Reflecting the Percentage of Respondents by Commute Type

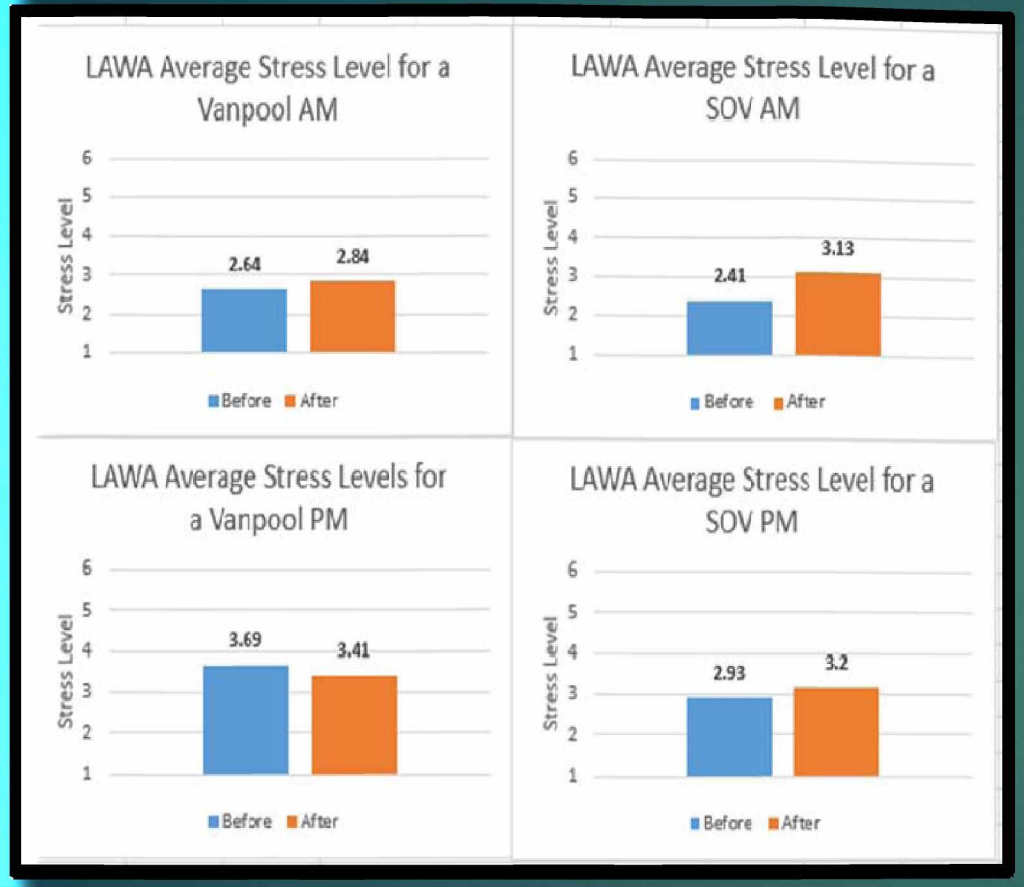


- 5,515 individual survey responses
- 3 survey sites:
  - LAWA
  - LinkedIn
  - Intuit
- 5 different Confidence Intervals all delivering outcomes that accept the hypothesis

Survey Site Satisfaction

- Each site provided feedback that the informed consent page was confusing and as a result they fielded a lot of questions.
- They also said the experience made them less likely to want to participate in University research if that is the process that must be used.
- These two issues were responsible for the lower scores for "fit" and "ease".

LAWA



Side by side comparisons of daily average stress level separated by mode

- Informed Consent: 187 total
- Average 84 daily responses
- Problem with survey distribution [U2: UAA IT Problems]

LinkedIn

- Informed Consent: 130 total
- Average 42 daily responses
- Lower response rate than the other sites
- Mix of respondents different than other sites [U1: Unbalanced response ratio]

Intuit

- Informed Consent: 204 total
- Average 66 total responses per day
- Survey Anomaly Identified [U3: Qualtrics Numbering Anomaly]
- For the 1-10 scoring the number "6" was listed twice.

Note: only 5% of responses chose "6" or higher

The Fine Print

VPB	VPA	SOVB	SOVA
3.64	3.47	3.25	3.88

$|VPB - VPA| / VPB = .046$ (5%) *lower stress*

$|SOVA - SOVB| / SOVA = .16$ (16%) *higher stress*

The VP is a 5% decrease

The SOV is a 16% increase

All weekday data aggregated to determine overall findings

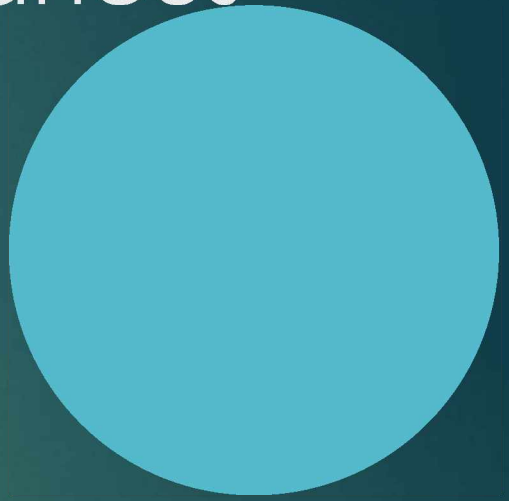
- CI Paired Data
- CI Independent Means with Different Variances
- CI Proportions
- All CI are at CI95 Confidence Level and showed statistically significant results
- Not normally distributed; SOV consistently to right of VP data
- Parametric and Non Parametric Tests support same results

Why Confidence Intervals?

- Confidence Intervals (CI) estimate the mean of the dataset using the desired level of confidence coefficient, in this case chose to be 95% (CI95)
- Data sets are interval based (a number between one and ten)
- Easier to report than non parametric test even though both actions support the same findings. CI are appropriate to this research, and the desired analysis of the dataset

CI Independent Means with Different Variances

- Compares actual scores instead of the delta
- Determines if one group is inherently more stressed than the other
- Compares only one set at a time, "Before" and separately, "After"



This would indicate any difference in stress could be attributed to lifestyle and not commute.

CI Independent Means with Different Variances

- Compares actual scores instead of the delta
- Determines if one group is inherently more stressed than the other
- Compares only one set at a time, "Before" and separately, "After"

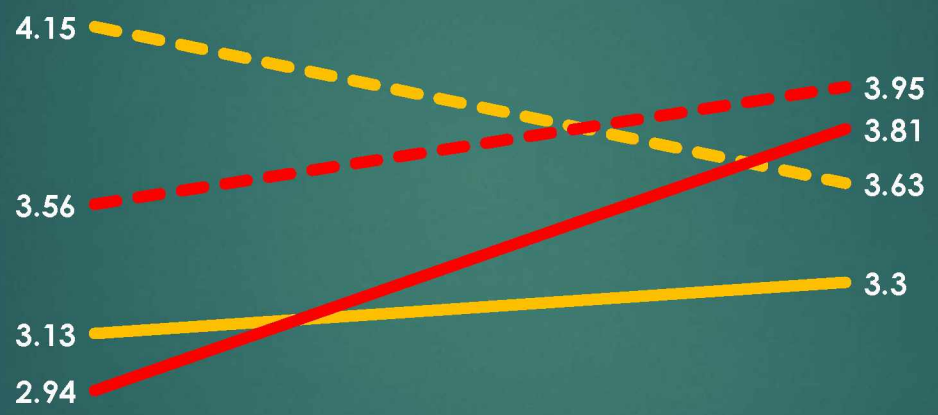
This would indicate any difference in stress could be attributed to lifestyle and not commute.

- Between VP and SOV no statistical difference for the morning "Before" commute.
- For the morning "After" commute, the SOV had between a (.14 and .88)CI95 greater average
- For the evening "Before" commute, the VP had between a (.18-1.00)CI95 greater average
- For the evening "After" commute, no statistical difference

Vanpool is only group that shows an actual decrease in stress level as a result of the commute

High Level Findings

Comparison of Vanpool and SOV Stress Level
Measured Before and After the Commute
on a scale of one (no stress) to ten (high stress)

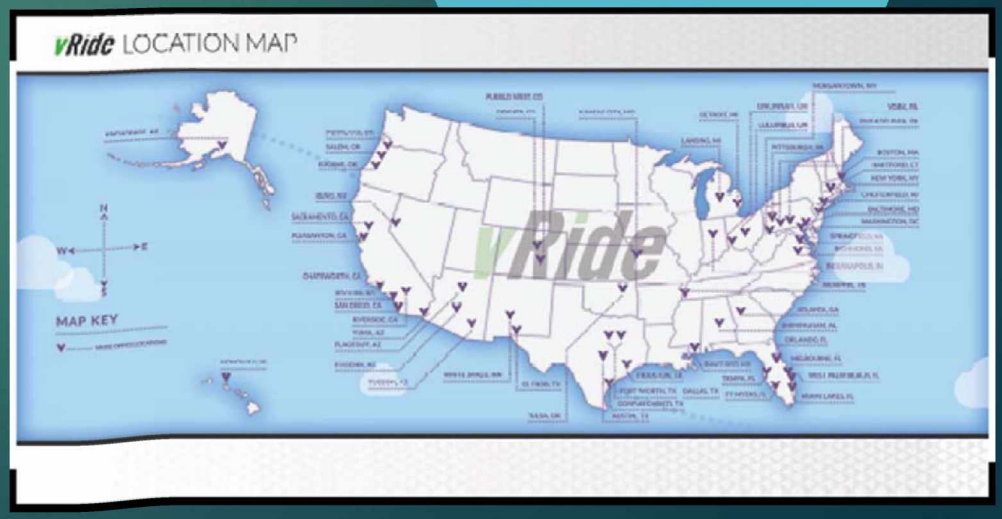


Truncated for Representation. Actual Scale 1-10

Survey Says

Next Steps

- Finalize Lessons Learned Repository
- Close out all Project documents
- Enhance final documents with any accepted suggestions or changes as a result of today's meeting
- Submit final package which will formally close the Vanpool Research Project



Questions

JOIN US .....

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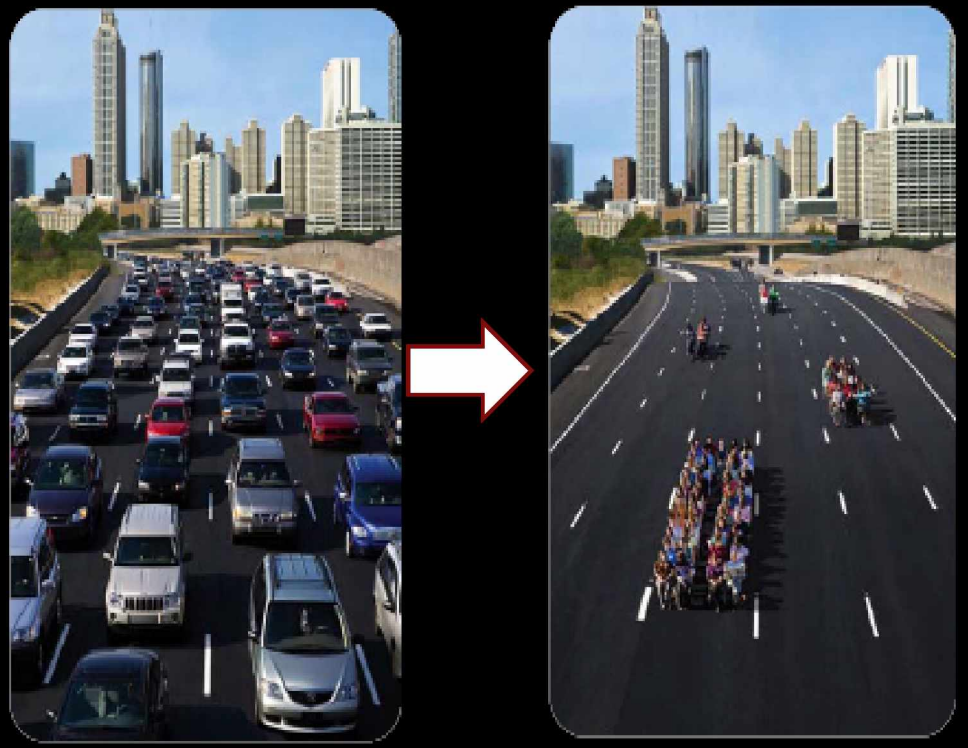


Crissy Ditmore
PM686B
Project Lessons Learned
Phase Two and Three – Vanpool Research Project

Phase Two and Three Lessons Learned

The Vanpool Research Project delivered many project improvements through the execution phase and into the monitor and controlling phase. The final paper and survey analysis were enhanced due to the controlling of the scope according to the plan. The project itself was enhanced because of the ongoing log of activities and was able to track and measure stakeholder expectations and experience. The three sections that demonstrated the most areas of improvement where lessons were learned are: 1- class outcomes, 2- survey outcomes, 3-project planning outcomes.

Class Outcomes

The course requirements were scheduled on a timeline that was a common sense approach to project delivery. The PPM's helped keep the project on schedule to make sure it was an acceptable level of progress throughout all phases of the project. The timeline as given to the class showed a "best case scenario" for the final deliverables. The dataset was large and therefore the schedule was compressed up front with plenty of room for lag time so that if any portion of the analysis slipped, there would still be plenty of time to deliver PPM's according to the requirements. This ended up being the right approach. The project was ahead of the class schedule and right on schedule CPI1 throughout all of 686B. Close to the end of the project, and just prior to submission of PPM4 an unknown risk (UR) was experienced.

The external editor did not return the paper and a new editor had to be identified at the last minute which delayed the final draft back to me by a week. This was the same timeframe that was available for the committee members to review and add their suggestions. Editing is always a matter of personal opinion, and therefore not all edits suggested by any one stakeholder were accepted, but were reviewed and incorporated where it made sense, and enhanced the final deliverable. In fact, many times the individual opinion of editors directly conflicted with the opinions of other editors, and the final determinations to accept or reject changes were made to conform to the needs of the project and to align with industry standards.

The rushed turnaround right at the end of the project left a negative experience just before the final stakeholder surveys went out. This timing left two of the high level stakeholders with lower overall satisfaction levels of the project than they had experienced for the entire year. The outcome meant that very high levels of satisfaction for a year were lowered in the final two weeks. That is a reality of projects. Stakeholders must be managed through to the close of the

project and in this instance their expectations outperformed their experience. While that is unfortunate, they were still well above the acceptable levels to determine project success, and therefore the project was still rated as "accepted" per the requirements of the PMP. These experiences were logged in the lessons learned repository so that the same issues can be mitigated against, and hopefully planned to avoid in the next survey project.

Survey Outcomes

The addition of SME Researcher Eric Goldstein on loan from the Project Sponsor helped immensely. Discussions with Eric delivered helpful insight in research outcomes. Specifically, the initial survey was intended to determine the differences between single occupant vehicle (SOV) commuters and their vanpool commuter counterparts. Instead, we decided including the "at homer' results of those same stress measurements. This information ended up being the most interesting of all of the paired datasets. It greatly enhanced the final outcomes to have this additional information even though it made the data analysis much more time consuming.

There were several realized risks that occurred during survey execution. All of the risks and the response plans are noted in the lessons learned repository. The one risk that was initially unaccounted for was an anomaly in the survey questions though draft versions were reviewed by no fewer than 50 people before being sent to the survey groups. A discussion with two separate professional researchers helped define what if any impact it would have on the validity of the data, and thankfully any potential damage was minimal and both stated that it deserved a "footnote at best".

I did not properly question stakeholder availability for the summer which is when the surveys went out. Since this issue was specific to class requirements it is not noted in the lessons learned log, and only included here. Just prior to starting the surveys Dr. Kim informed me that he would be unavailable during the summer. This minimized his ability to provide input during this very critical time and therefore it was a big lesson to learn that when aligning a project with class responsibilities I overestimated committee availability during times when classes were not taking place. That input was replaced by Dr. Goldstein as well as Dr. Dix during survey execution and by Gary Kretchik during data analysis. The front loaded schedule meant that the majority of the data analysis had to occur before 686B began, and so by the time class started again the majority of data analysis was complete and reviewed by the research team for understanding.

Project Planning Outcomes

The lessons learned through the actual project planning process are mostly rooted in the narrowly defined, fully developed scope that was part of the initial Project Charter. In the future, not all projects will likely be able to be scoped as thoroughly or easily from the start. It was much easier to manage and control the project as well as develop the WBS and project schedule because of it, so even though I did not realize any scope creep I can see how easily that would have happened. The Change Management Process as determined in the PMP was executed properly and

therefore changes were accepted throughout the project only to the extent allowed by the plan. This allowed for stakeholder satisfaction to remain high because there were established guidelines for what changes would be accepted.

A big lesson to take away from the planning phase is that even though this is a small project, it still required a larger risk review than initially performed. A quick risk assessment minimally addressed the known risks, and a broader evaluation, including SME's in the research field, would likely have minimized the number of unaccounted for, but realized risks through the execution phase. Each time a risk was realized that was not part of the original plan was realized it was logged. However, the professional researchers that were consulted at each point made a point to say "that happens all the time". This reminded me that I must not have included them in the risk assessment, which left the project open to greater risk than it should have been. I won't know if they would have identified those particular risks up front, but their reactions told me that I did not fully understand the scope (which I knew) but I also did not go far enough to ask the right questions in order to plan for survey risks appropriately. In the end the survey data ended up delivering high level statistically valid findings, but it could have easily gone the other way and two months' worth of data could have been completely invalid. The next survey project will have a much more robust risk assessment in advance.

Conclusion

In general the greatest lessons that I gained from this process were due to experiencing the process itself. It did confirm some decisions that I have made previous to this class, which contributed to what I believe delivered a well-documented and planned project. I believe every PPM submission is of high quality, and as a result the project and products are both of high quality. However, the experience also delivered some sound PM lessons that allowed me to grow and continue to learn even as I demonstrated mastery in certain areas. The project schedule and the initial risk assessment are both areas that I gained the most additional knowledge. I think this will be a continual process, and is one of the reasons why I chose project management. I enjoy the learning aspect, and that there is always something to improve upon.

The lessons learned repository is very detailed and delivers a lot of information of the project. Though this serves as a general narrative, the repository is where the individual lessons and notes are housed. I am particularly proud of the communication log as it delivers interesting information about why certain decisions were made at particular times and I believe will serve as an additional tool for project review during the next survey based research project.

A final lesson to learn for future classes as well as 686B is to have a better understanding of what information needs to be conveyed during the defenses. From what I could tell there was no real amount of information specific across the board. While these are our own projects, it would make more sense to know what specifically the committee would like to everyone to present so that no one student presents too much, or too little information. The small group that we organized to do a run through in advance of the defenses was very helpful. I believe gave a great opportunity for us to refine our presentation and identify areas where the data that was presented

did not exactly convey what we wanted it to say. I believe a comparison of the draft and the final version of the presentations will reveal how the changes enhanced the final delivery of the project information.

Crissy Ditmore
PM686B
Knowledge Area Selection
Phase Two and Three– Vanpool Research Project

Knowledge Area Selection Review

The nature of the Vanpool Research Project identified that the largest areas of risk to the scope all were rooted in stakeholder understanding and satisfaction of the project. Personally, I believe there is no way to achieve a high level of stakeholder satisfaction without a strong communication management plan. Therefore, the best way to control scope, with scope being the area that must be constrained according to the PMP, was to select the specific Knowledge Areas that would assist the most in controlling scope per the needs of this project. For this project, Scope Management, Communication Management, and Stakeholder Management are the areas that I chose to focus on to demonstrate mastery of their inputs and outputs, and process improvement.

Inputs

The Stakeholder analysis began in advance of the class portion of this project, because project definition began in advance of PM686A. Over the years I have tracked those persons of influence within the TDM industry that would be potential benefactors, subject matter experts, and possible distractors to the vanpool industry as a whole. This allowed the net to be cast wide when the project was ready to begin. Interviews with individual stakeholders delivered potential other stakeholders that were left out of the initial list mainly due to my assumption that they would not have the time to participate meaningfully in this project. However, the interviews conducted with the initial stakeholder group provided discoveries that those assumptions could be wrong. In at least one case, a stakeholder that delivered very helpful insight in the survey development was part of the project as a result of doing a second and third round of stakeholder analysis even as the project was ongoing.

The Communication Expectations of the stakeholder group was determined through the initial interviews. Each stakeholder provided baseline inputs for the project, defined their acceptance criteria, and assisted in determining how to define how product/project success would look. They individually discussed their acceptance criteria. This is what went into the development of the Requirements Traceability Matrix, to be discussed a little later. The Communication Register was developed using the desired individual levels of expected communication during the interview process of the stakeholders. The stakeholder identification process was an iterative cycle that delivered more potential stakeholders through the project. Especially during survey development, it was important to continue updating the schedule as necessary to include any new meetings with new stakeholders. These processes supported each other during the development

of the PMP, and the process used to develop their output documents reaffirmed initial thoughts that it would be very difficult to have a well-developed communication plan in the absence of a strong stakeholder management plan.

The scope of the project was defined early on as being the most important aspect of the project to constrain. Any addition in the scope could drastically alter the ability to stay on schedule for the final project deliverables. Though additions to the scope in any other case might deliver a better product (survey outcome) the guiding factor in this case was the ability to meet all class deliverables and stay on the path to finish this project in the required two semesters. To make the future follow on surveys deliver a better product, those additions needed to be tracked and logged for future use even though they would be excluded from this project. These observations have logged clear improvements to be applied to future research projects.

Having a clearly and narrowly defined Charter and Scope Statement allowed for an easier path for controlling the scope. The inputs of the requirements of the highest level stakeholders allowed for the project definition and scope statement to be further refined before the project began. This process of iterative refinement very early on made the rest of the project documents reflect the narrowly defined scope. Risk identification became an early input to the change management plans and processes to address any realized risk in a way that was feasible for this type of project. Though those plans are not selected as areas for emphasis, development of their subsidiary plans were inputs to the controlling of the scope. One of the lessons learned in this area did involve the risk assessment as it pertained to the stakeholder input. This is an identified area for improvement in future projects of this nature. A better risk analysis that involved the researcher stakeholders (Kim, Hull, Goldstein, and Dix) could have identified additional risks so they could be properly mitigated against, or response plans developed in advance.

Outputs

Stakeholder Register as an output of the Stakeholder Management process provided the information needed to execute the communication as required by the schedule. The register itself was then used to develop the Requirements Traceability Matrix output. These planning tools were well written and executed according to the plan, which in turn assisted with keeping the project on schedule. Putting so much effort into the planning phase assisted the execution phase greatly. Realized risks activated responses according to the plan. Requests for scope change by stakeholders was easily controlled according to the change management plan. Anything that was experienced that was not part of the original PMP was included in the lessons learned repository for future use. The WBS was fully developed at the end of Phase One to a level such that it did not change (no work packages added) during all of Phase Two and Three. The schedule had a few changes which was fine since it had sufficient slack built in to account for those changes, but no additional work packages were added. I believe that is a great indicator of the requirements discussions held with the stakeholder group that created the WBS. I also believe it is indicative of a mastery of scope management for this project in that no additional work was added or accepted

Measurement of the stakeholder satisfaction levels was made possible through the baseline of their individual expectations through the initial interviews. The baseline gave a proper level of expression to understand how to maintain their satisfaction. Stakeholder satisfaction was measured through a survey at three points in the project. On a scale of one (low) to five (high) They were asked to rate Communication Time(Q1), Communication Quality(Q2), Current Involvement (Q3), Desired Involvement(Q4), Response Time(Q5), and Overall Satisfaction in phase two and three (Q6).

The results are as follows:

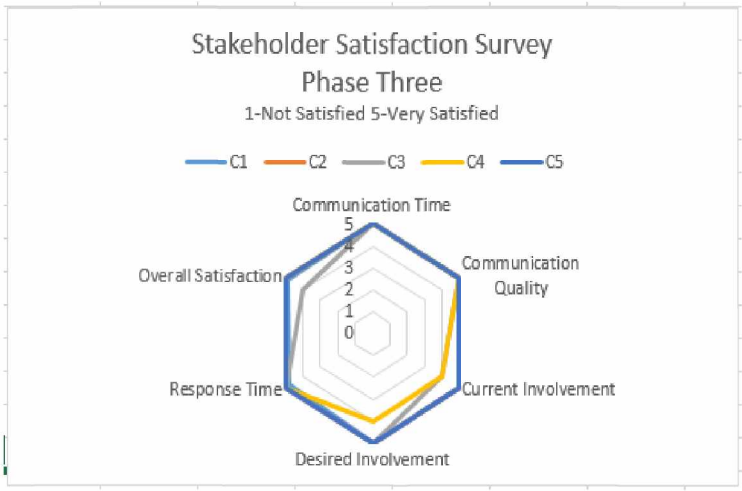
Phase One	
Piccard	5, 5, 4, 4, 5
Hull	5, 5, 3, 3, 5
Kim	5, 5, 5, 5, 5
Martz	5, 5, 3, 4, 5
Deming	5, 5, 5, 5, 5

The close of Phase One identified that a stakeholder wanted a higher level of involvement, and the communication plan was updated to involve them more regularly during execution. This allowed his response to align better during Phase Two as seen below:

Phase Two	
Piccard	5, 5, 4, 4, 5, 5
Hull	5, 5, 4, 4, 5, 5
Kim	5, 5, 4, 4, 5, 5
Martz	5, 5, 4, 4, 5, 5
Deming	5, 5, 5, 5, 5, 5

Phase Two observed an alignment of stakeholder expectation and delivered the highest level of overall satisfaction of any phase of the project. This was critical because Phase Two was the

actual survey execution which had the most risk of potential scope creep by stakeholder initiation. This did not happen due to the communication and scope management plans.



Phase Three:

Piccard	5, 5, 5, 5, 4.75, 4.9
Hull	5, 5, 5, 5, 5, 5
Kim	5, 5, 4, 5, 5, 4
Martz	5, 5, 4, 4, 5, 5
Deming	5, 5, 5, 5, 5, 5

Phase Three included a risk that was realized in the last two weeks of the project. The notes regarding this are listed in the risk register as well as the lessons learned dialogue. However, the result triggered a change in overall satisfaction level of two stakeholders, which lowered their score slightly. Stakeholder 3 noted a 20% decrease in overall satisfaction with a corresponding increase in desired level of involvement. This is a fair observation because I did not manage the communication of the risk being realized to that particular stakeholder because it occurred outside of the communication plan. Future projects should include a response to all high level stakeholders for any risk that is realized even if it fall outside of their desired project update plan, especially that close to the end of the project. In any case, the level of "acceptance" of the project for the stakeholders was designated as a minimum number of four at the close of the project, and all scores are at a four or above. This designates the project deliverables as "accepted" according to the PMP as well as distinguished the project deliverables as "satisfied".

Conclusion

The scope was easily controlled even as risks were being realized due to the clearly defined change management plan, and the risk identification and response measures. The highest risk involved any addition to the scope. The initial plans lent themselves to acceptance by the stakeholders to manage change according to the pre-determined procedures in a way that was still acceptable to them. This again is an exhibit that demonstrates the plan that was developed for this project was just the right size, and had prompted overall project satisfaction of all stakeholders. Mastery in these Knowledge Areas for all phases of the project has been demonstrated. Even through mastery, I believe each project is still a learning process and everything I have learned in this project will enhance my abilities as a Project Manager and leader in future projects.

PROJECT MANAGEMENT PLAN

VANPOOL RESEARCH PROJECT

VERSION: 9 REVISION DATE: 11.30.2015

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Lessons Learned Repository

Section 1. Project Scope

1.1 Scope Statement

This project is to plan, execute, and analyze the results of a survey for vanpool and single occupant vehicle commuters. The survey will consist of questions that relate to general commute and demographic information as well as self-reported levels of stress as observed before and after the commute. The final deliverable will be a formal document of the research and observed outcomes with the intention of publishing the data to enhance the vanpool body of knowledge.

1.2 Project Objectives

Create project documents that meet or exceed the PM686A and B requirements.

Develop a commute survey that observes the individual level of stress among vanpool and single occupant vehicle drivers before and after the commute.

Analyze the survey data and outcomes to determine if there is a statistical significance of the outcomes (Using Confidence Intervals and other tools if necessary).

Report the data and the statistical observations in a written report that is of high enough quality to pass peer review for publishing.

Manage stakeholder expectations to control the scope of the survey while establishing baseline vanpool research.

Control communication levels to provide adequate process progress without impeding on the actual project progress.

Manage the scope for potential creep from outside pressure to increase the survey questions to control a manageable amount of data.

	Schedule	Scope	Cost
Constrain		X	
Enhance			X
Accept	X		

1.3 Stakeholder Analysis and Identification

Add and delete project stakeholders as new stakeholders join through the development of the project.

Utilize the Stakeholder Management Register (Appendices) to define the individual communication expectations and requirements. Add each anticipated meeting to the project schedule to ensure repetitive meetings are not skipped.

Evaluate stakeholder satisfaction through project closure through quarterly informal interviews and log new or changing expectations or outcomes in the lessons learned file (if any).

Perform exit interviews of all high level stakeholders to gain perspective on future needs for research based on learned outcomes. (Could be done in a survey)

1.4 Change Control and Management

Project Manager is the only authority to make day to day and minor changes to the project. Minor changes are defined as any change that does not affect the budget or schedule in any way. Any change that increases the project scope, budget or would require additional organizational resources must receive approval from either Project Sponsor. All other changes are at the discretion of the PM but only after conferring with the Direct Supervisor.

ID	Change Log ACCEPTED
C1	2.10.15 Phil Winters* final review of survey questions in advance of submitting for IRB approved. [Corrective Action] *If Phil Winters is unavailable, Eric Goldstein may serve as substitute, but one or other must approve before submissior
C3	3.18.15 A third company was added to the number of survey sites to be administered to minimize the potential for A site not delivering statistically sound results. [Repair Action]
C4	7.15.15 Realized Risk R4, implemented response strategy to increase the number of survey sites to increase Responses until a statistically viable data set is achieved. [Corrective Action]
C5	9.1.15 E. Goldstein suggested narrowing the problem statement as well as the Abstract and remove the references to comparing the outcomes to health related outcomes in order to leave enough room to more effectively report out the data as observed in the final deliverable. [Corrective Action]
C6	10.1.15 After reviewing the response rates it was discovered that the responses over the weekends at every site were Much lower than during the weekdays. After conferring with G. Kretchik it was determined the appropriate action is to Ignore all responses from the weekends and not include that information in the analyzed data. Since the surveys were Executed according to the plan, and making this change increases the likelihood for a statistically valid data set this Change was accepted. [Repair Action]
	Change Log UNACCEPTED Must give rationale
C2	2.25.15 L. Huber suggested including carpool data in the survey as there would likely be more carpoolers than Vanpoolers to respond. UNACCEPTED. At this time inclusion of carpoolers is outside of the scope and is not a change the PS is willing to accept. Added to the lessons learned log for future use in follow up research. [Preventive Action]

Any action must be reflected in the Change Log above:

Corrective Action: Any action that must be taken to align project outcomes with project scope. Corrective action will be taken when issues arise that relate to the project but have the potential to increase scope.

Preventive Action: Any action that is performed before the survey begins to keep project scope constrained.

Repair Action: Any action that must be taken to address an outstanding issue in the project to align with project scope and goals, or to keep the project on schedule.

1.5 Risk Evaluation

Risks are identified and evaluated according to the definition below. If a risk is realized over the course of the project that falls in the medium to high category a response plan must be developed with the high level stakeholders. Known risks must be monitored as applicable for any elevation in rating.

It is known that given the uniqueness of the research there are many opportunities for unanticipated risks to appear. These are defined as anything that affects the scope, or is experienced by the project that is not according to plan, and not accounted for in the PMP. These additions will be logged in the lessons learned repository and numbered for project reference. An explanation of the follow up or actions taken must be reported.

Key:
Low: no change to cost, minor change to schedule, no change to scope
Medium: minor change to cost, minor change to schedule, no change to scope
High: change to cost, change to schedule, change to scope

ID	Known Risks		
R1	IRB approval	Rating: Low	IRB could delay project by initial revisions to methodology
R2	Stakeholder Scope Creep	Rating: High	Stakeholders introduce new elements that increase scope
R3	Federal Transportation Bill Reauthorization	Rating: Med	Action by congress to start action on Transportation in a way that requires my involvement as determined by Jon Martz
R4	Survey Response Low outcomes	Rating: Low	Survey responses are too low to achieve statistically relevant

1.6 Project Deliverables

The project deliverables will consist of all required documents for the PM686A and PM686B Course Requirements. Additionally, the final deliverable will be a research paper containing the outcomes of the survey described in the Scope Statement.

1.7 Assumptions

The preferred methodology for administering the survey is via mobile application. Currently, there are vendors in the marketplace that offer this service. They are willing to provide this service for this particular survey.

IRB approval will align with the required structure for administering the survey by the employers that participate.

At least two companies are willing to allow access to employees for the purposes of a survey in the State of California

1.8 Constraints

The Survey must be performed during the summer between 686A and 686B to accommodate work travel schedule.

The survey must not be performed for less than 14 days, but not more than 30 (per survey site).

1.9 Exclusions

Applications of how the data should be used in future business decisions (recommendations are permitted, but in broad idealistic terms)

No more than three Employers (with statistically reliable data) to administer the survey through for the project

Future or follow up surveys (not including secondary surveys if necessary due to statistical reliance)

Research on any other mode of transportation (carpool, bus, telework, etc)

Section 2. Project Authority and Milestones

2.1 Funding Authority

Resources will be identified as necessary, and provided utilizing organizational assets when approved by the corporate stakeholder group. vRide Inc. is the funding authority, with CEO Ann Fandozzi as the Project Sponsor. Ann will be the final determining factor for resource allocation.

2.2 Project Oversight Authority

Crissy Ditmore will serve as the Project Manager. Crissy has full authority to respond to day to day needs of the research project, and may make changes to the schedule without approval from the stakeholder group. Only the Project Sponsor may assign any changes to the research topic.

2.3 Major Project Milestones

ID	Milestone/Deliverable	Planned Completion Date
M1	Final Project Schedule	April 10, 2015
M2	Final List of Research Questions	March 30, 2015
M3	Final Report of Data Observed	Nov 20, 2015
M4	Start of survey	June 1, 2015
M5	PPM Deliverables	Due dates according to syllabus
M6	Presentation of 686A findings	April 20, 21, 2015
M7	Draft report to be sent to Editor	Oct 31, 2015
M8	Presentation of 686B deliverables	Nov 30 and Dec 1

2.4 Acceptance Criteria (with measurement tools)

Project will be accepted when all PPM Deliverables have been submitted and scored with no less than a score of 75% for each deliverable

Phase One acceptance is contingent upon a final PM686A grade of “B” or higher

Phase Two acceptance is at least two employers with definitively acceptable statistically reliable data. Alternatively, the PS can determine to allow the paper to continue reporting out reasons why the future surveys can be improved to increase the chance of reliable data.

Phase Three acceptance is contingent upon final PM686B grade of “B” or higher

Stakeholder satisfaction (within adherence to scope*) of Level 1 stakeholders of “high” as measured throughout project as determined through analysis of meeting notes in the Lessons Learned Repository (Overall Project Satisfaction level of 4 or higher).

Stakeholder satisfaction (within adherence to scope*) of Level 2 stakeholders and below as "accepted" as determined through analysis of meeting notes in the Lessons Learned Repository

Research acceptance will occur during PM686B and is excluded from any expectation in PM686A

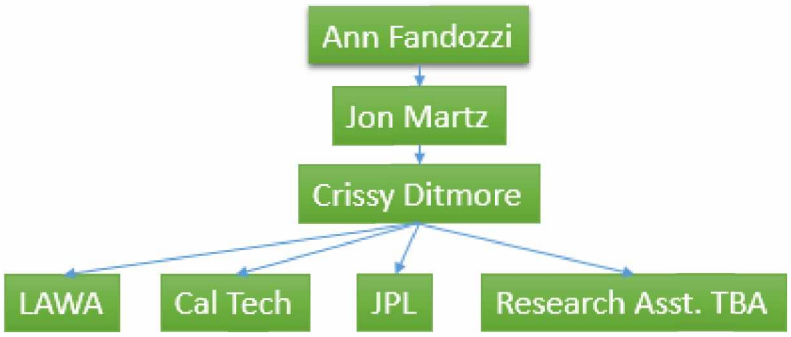
Delivery of final project deliverables in accordance with the approved scope statement

**All comments analyzed to determine stakeholder satisfaction that are against the constraints of the project scope will not be considered. Dissatisfaction due to inability to expand the scope will not determine project success, or count toward acceptance criteria. Note: Desired level of participation may not meet the project's intended level of participation, but is used as a measurement tool to identify areas to enhance stakeholder satisfaction. PM determines acceptable level of participation for stakeholders but uses their desired level to make decisions about the project and communication to enhance their experience.*

Section 3. Project Organization

3.1 Project Structure

The reporting structure of this project is outlined below:



3.2 Roles and Responsibilities

Role	Responsibility
Ann Fandozzi	Project Sponsor, Funding Authority
Jon Martz	Project Stakeholder, PM's oversight, Direct Supervisor
Crissy Ditmore	Project Manager
Research Assistant	Dependent upon complexity of data, RA may be brought on to analyze the data set before PM writes the outcomes
Los Angeles World Airport (Employer A)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
Cal Tech (Employer B)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
JPL (Employer C)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
Editor	A person (or persons) to review the final draft of the final deliverable
LinkedIn (Employer D)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
Intuit (Employer E)	Provide access to appropriate sample group of SOV commuters and vanpool commuters

3.3 Project Facilities and Resources

Any resources beyond those listed here must be requested and approved in writing by the Project Sponsor.

Resource Requirement	Responsibility
Recipient of Survey Data	PM has access to organization assets as required for this project. These assets are currently limited to customer data, use of assigned computer, and access to subject matter experts.
Survey methodology	PM to identify proper research tool to best suit the outcome of data desired. It is desired that commuters are able to post "real time" before and after their commute in order to retrieve the best data possible. If a mobile application for this purpose cannot be identified traditional survey options (Qualtrics, Survey Monkey, etc.) are acceptable.
Follow up Survey	PM to allow time for secondary survey to be held during PM686B (or before) if the response rate for the first survey does not deliver statistical significance.

Section 4. Research Information

Any resources beyond those listed here must be requested and approved in writing by the Project Sponsor.

Research Topic:
Compare the self-reported levels of commute related stress from commuters traveling to and from [Employer One], [Employer Two], and [Employer Three] in the State of California by commuters from both vanpool and SOV modes.

Hypothesis:
Commuters that utilize vanpools to get to and from work have lower levels of stress upon reaching their destination than their single occupant vehicle counterparts.

Qualitative Research involving quantities--- Could have correlational aspects.

Literature Review:
An analysis of existing reports and peer reviewed journals published by the Transportation Research Board (TRB), the Center for Urban Transportation Research (CUTR), as well as the National Center for Transportation Research (NCTR). All are recognized in the industry as preeminent sources for transportation and commute related data. Research revealed that vanpooling is mentioned among many documents, but does not provide any empirical data for vanpool as a mode, specifically. The previous research performed were primarily mentioned twice in articles from 1998, and 2006, both of which quote leadership from VPSI Inc. (vRide's previous branding). In all cases the information provided was best of the estimations of SME's and did not perform any type of actual vanpool user survey or analysis.

Also used the UAA Consortium Library to seek health benefit of stress reduction articles. For the purposes of the vanpool specific review CUTR, TRB, and NCTR are more appropriate sources.

Keyword Search:
Vanpool
Carpool
SOV
Commuter Stress
Health benefits of stress reduction
National Transit Database

10.5.15 Update: Added Texas A&M University Website as well as Edenred website for document review.

Preliminary Research Methodology:
A survey will be used to allow commuters at selected locations self-report levels of stress before and after their commute to see if there is a correlation between stress level as viewed by the individual and commute type (specific to vanpool).

Statistical analysis of the information will be performed to include an array of statistical tools, dependent of the approved structure of the survey questions. Inclusion of demographic data will be helpful in maximizing the use of descriptive statistics. Descriptive Statistics will be used to determine the confidence intervals for the data, and will be the main focus for the report. As time and space allows for this project the following additional methodologies may be applied:

Relative frequencies may be used if the sample set is large enough to project the data over a longer period of time or circumstance. Data will be analyzed to determine if it has a normal distribution to see if any addition data can be inferred. Multiple comparison tests (ANOVA, Pearson, etc.) may be used if the data retrieved is determined to have statistically valid applications. Use of individual tests will be dependent upon the data reported, and the sample size.

For the purposes of this study, stress is defined based on the Webster's Dictionary definition of "a physical, chemical, or emotional factor that causes bodily or mental tension and may be a factor in disease causation".

Final Research Methodology:
1- Initial daily averages to ensure response rates are appropriate.
2- Descriptive Statistics to report the generalized overall data, and summary statistics.
3- Confidence Intervals of the data as derived from the descriptive statistics. The CI was determined to be most appropriate for determining the hypothesis test on the average differences of the mean. For the report this is performed on each of the morning before and after as well as the evening before and after commutes. The formula for explaining the data is as follows:

ΔS VP
ΔS SO

Is there a statistical difference?

Key: Δ=Change (as averaged each day of the study before and after their commute)
S= Reported Stress
VP= Vanpool
SO= Single Occupant

Section 5. Points of Contact

Primary Contact	Name/Title/Organization	Phone	Email
Crissy Ditmore	Government Account Executive	619-980-0523	Crissy.ditmore@vride.com
Secondary Contact	**Name/Title/Organization**	**Phone**	**Email**
Jon Martz	VP Gov Affairs	248-597-3500	Jon.martz@vride.com

Section 6. Subsidiary Plans

**Denotes Subsidiary Plan selected as Emphasized Knowledge Area for the Capstone Project. These plans will have additional attachments in the Appendices Section.

6.1 Integration Management Plan

Project Integration will occur iteratively throughout the project. Version numbers will be associative of specific submission timelines according to the Capstone PPM submission schedule. If a plan is not updated the version number may stay the same during the PPM. All versions during the PPM 4 submission must reflect at least the number 4. PM 686B will begin with at least versions numbered as 5 as changes will need to continue to occur between the two courses.

During each PPM phase all changes either accepted or denied by be updated through all subsidiary plans and documents. At each PPM each of the three selected knowledge areas noted for mastery (by asterisk) will be reviewed to ensure each plan reflects properly changes listed in every other plan. Ex: A change in the communication register must be accompanied by a change in the requirements matrix, if applicable, etc. By PPM4 all changes to the schedule must be appropriately reflected in the requirements traceability matrix to ensure all stakeholder requirements are part of the work being done, and to delete any stakeholders that do not have work specific to the project appropriate to their level of involvement.

PM686B must have all project documents updated to reflect the progress of the Phase Three insertions and through to date by PPM2.

6.2 Scope Management Plan**

Scope will be managed as a function of stakeholder management. For this project all possible levels of scope creep are related directly to individual stakeholders (or as a unit, if classified as such). To ensure scope remains as close to the project charter as possible, a change management plan is included in the PMP. The change management plan requires that specific types of change occur in a controlled environment based on pre-determined scope requirements as referenced in Section 1. Changes may only occur according to the Change Management Plan as referenced in Section 1.4. A response strategy will trigger if a change is accepted that is not according to the plan. An automatic review of the Change Management Plan will be required if this takes place.

Scope will be monitored, controlled, and recorded through the Appendices documents including the Lessons Learned Repository as well as the Knowledge Area Selection Plan and the Knowledge Area Application and Performance Plan. Scope may be changed based on pre-set values as referenced in the PMP, and changes that are accepted according to these plans will not count against the scope management process. All accepted changes essentially re-baseline the rest of the project documents and the remainder of the project carries on as if the change were part of the original scope as defined in V1 of the Project Charter.

WBS is broken down into Project Phases. There are 3 phases of this project:

Phase One: The PM686A Phase which includes all project planning (including all PPM submissions) and IRB development and submission. It includes the identification of the employers that will be used in the project as well as the stakeholder and identification of the requirements that will lead to a successful product outcome. The survey that will be used in Phase 2 will be developed and finalized during this phase, in advance of the IRB submission.

Phase Two: The survey implementation phase which includes a different set of high level stakeholders than phase one contained, though all stakeholders throughout the project were identified during phase one, new stakeholders may be added throughout to track new needs and potential risks. A portion of the analysis of the outcomes will occur in this phase.

Phase Three: The observed outcomes of the survey will be analyzed and developed into the final PM686B deliverable. This phase will also include all classroom PPM's for the Capstone project. The ongoing list of sources for the literature review will be used to develop the final paper.

Breaking down the project into phases will allow the scope to be controlled through the WBS and the schedule while using the Change Management process to deal with anything that comes up during project execution. The WBS itself is presented intentionally at a relatively high level without much detail in each work package. Resource allocation will be controlled through the schedule. The WBS is a simple reference guide to ensure all work is accounted for according to the requirements traceability matrix, as well as according to the schedule.

6.3 Time Management Plan

Time will be managed through the MS Project application via the schedule. No further elaboration of this plan is necessary for this project.

6.4 Cost Management Plan

Given the single dedicated resource nature of this project cost management will occur at the PM level. The only cost requirement is that the only expenditure of vRide funds fall at or below the $2,000 limit budgeted for the incentives. The IRB submission will outline the specific kinds of incentives to be used, and upon IRB approval, the company will release the funds to be used as part of the study. No further elaboration of this plan is necessary for this project.

6.5 Quality Management Plan

Quality for this project is defined as completion of all PPM's as well as on time delivery of both PM686A and PM686B final presentations. Quality within each of the other emphasized knowledge areas is defined separately in each of the subsidiary plans and controlled through the stakeholder survey and communication management tools. Product quality is measured by a final deliverable which includes statistically valid commute survey findings supported by a research document that delivers sound analysis of the survey data. No further elaboration of this plan is necessary for this project.

6.6 Human Resource Management Plan

Given the single human resource dedicated to this project, a detailed human resources management plan is unnecessary. The allocation of the PM's time will be controlled through the Project Schedule. Additional resources are permitted according to the PMP as permitted by the PS, given the constraints of the survey results. The PM is responsible for identification of an appropriate research assistant, if necessary, and is responsible for their selection and time allocation to this project.

6.7 Communication Management Plan**

Communication management is planned according to the stakeholder requirements listed in the Communication Register (Appendix). It will be monitored and recorded within the Communication Log (Appendix) as well as within the Lessons Learned Repository (Appendix). The communications for the highest level stakeholders will be included in the project schedule to ensure the meeting times are being kept, and a log of changes if meetings are cancelled. Cancellations are expected and accepted, but all planned meetings must go into the project schedule even if they are later deleted.

Communication level of quality will be determined throughout the project based on the surveys provided by the stakeholder group. Timeliness of communication, and quality of information provided will be measured as a marker to determine communication satisfaction among stakeholders. The attached documentation regarding the communications of the project are inclusive of the communication plan and are included in the updates as listed in the Knowledge Area Selection and Application documents.

6.8 Risk Management Plan

No formal risk analysis is necessary for this type of project, and as such a high level risk evaluation and management plan is omitted intentionally. Section 1.5 Risk Evaluation of the PMP lists the only risk identification, measurement, and management tools that are required for this project. If any risks are realized they will be logged according to the requirements traceability matrix as well as the lessons learned repository. All risks must be logged and numbered with response measures performed according to the rating schedule in the risk evaluation section. Unaccounted for, but realized risks will be catalogued through the lessons learned repository for use in future projects.

6.9 Procurement Management Plan

A procurement management plan is not necessary for this type of project, and is omitted intentionally.

6.10 Stakeholder Management Plan**

Stakeholder Management is planned according to the Stakeholder Register (Appendix), Requirements Traceability Matrix (Appendix), and the Knowledge Area Selection, Application, and Performance Documents (Appendix). Stakeholder satisfaction will be measured over the course of the project using stakeholder surveys to determine expectations compared against the outcomes observed over time. The abbreviated Stakeholder Management plan is in Section 1.3. This version will be used to guide the appendix documents during the project execution phase. The requirements documentation is used to develop the schedule and consider all project and product needs. Lessons Learned will be

included in the repository. All requirements linked to the WBS by number and identified in the RTM must be reflected within the schedule as work packages.

Section 7. Glossary

TDM: Transportation Demand Management

vRide: A Private Provider of Public Transportation by Vanpool

Vanpool: A group of volunteer commuters using a 7-15 passenger vehicle for the work commute leased by the private provider.

SOV: Single Occupant Vehicle

PS: Project Sponsor

PM: Project Manager

TRB: Transportation Research Board

CUTR: Center for Urban Transportation Research

SME: Subject Matter Expert

ACT: Association for Commuter Transportation

PPC: Public Policy Committee

NCTR: National Center for Transportation Research

JPL: Jet Propulsion Labs

LAWA: Los Angeles World Airports

TAMU: Texas A&M University

Section 8. Revision History

Note: Individual revisions do not need to be tracked. Revisions may occur over a range of dates, and numbered simply by the new version number, not for every individual revision.

Version	Date	Name	Description
1	1.26.2015	Project Initiation	Initial Project Document for PS Approval
2	2.10.2015	Refinement	Primary Committee Review
3	3.15.2015	Accept Change	Revise to reflect C3 as accepted by PS
4	4.8.2015	Include Subsidiary Plans	Update all primary and subsidiary plans in the PMP to reflect the current nature of the Project and latest version of the schedule.
5	7.15.2015	Update Employer Information	Update all Project Documents to include realization of risk R4 and to initiate response plan.
6	9.13.2015	Conformance	Ensure all Project Documents are in conformance and reflect all Phase 3 changes and results.
7	10.5.2015	Conformance	Updated all documents to align with MS Project. Added Lit Review Sources
8	11.4.2015	Final edits	Update Risk Log
9	11.30.2015	Final edits	Review for conformance for all project documents.

Section 7. Appendices (Project Documents)

Project Charter

Communication Register

Communication Log

Stakeholder Register

Knowledge Area Selection

Schedule (Gantt)

WBS

IRB Application

IRB Training Completion Page

Sponsor Letters

Project Updates

Lessons Learned Repository

Vanpool Research Project V.8 11.30.2015		Communication Needs	**Identification Informa**		
Internal Stakeholders (internal to performing organization)	Active/Deactivated Status (deactivate as needed)	Preferred communication methodology	Organization	Position/Title	Location
Ann Fandozzi	Active	Text preferred, as well as short to the point (3 bullet) e-mails if additional support or resource allocation is required.	vRide	CEO	Philadelphia, PA

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Jon Martz	Active	text and e-mail preferred. Project updates should always be conference call, with notes taken, but no written updates are necessary	vRide	VP Gov Affairs	Troy, MI

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vRide Employees	Active	e-mail very infrequently if at all. Main communication should be one time in company internal newsletter.	vRide	Misc	US and EU
ride Employees	Active	e-mail only if absolutely necessary, or work on project conflicts with ride duties. All resource conflict issues are to be texted immediately.	ride	Misc	Philadelphia, PA
Jack Gallagher	Active	call when issue arises in regard to data that was analysed	Vride	Misc	Philadelphia, PA

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External Stakeholders (external to performing organization)			Organization	Position/Title	Location
Roger Hull	Active	phone calls appreciated. No scheduled regular meetings are required, Consult impromptu as needed. Send written project update every 2 weeks though not a Roger requirement, send with all other committee updates where this was a requirement.	UAA	Professor	Anchorage, AK

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LuAnn Piccard	Active	Schedule conference call every two weeks at a set time. E-mail for individual questions copy Muey for quick response. Send written project updates every two weeks.	UAA	Professor	Anchorage, AK

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Seong Dae Kim	Active	Check Blackboard for notes and comments of PPM review. Send project update via e-mail every two weeks along with rest of committee. Phone calls are encouraged for questions that cannot wait until the next class session.	UAA	Professor	Anchorage, AK

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Devon Deming	Active	text is acceptable for short responses. E-mail is preferred for logging decisions. Phone calls are appreciated for project updates as needed, and only closer to the time that the research begins.	Los Angeles World Airports	Rideshare Manager	Anaheim, CA

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Carolyn Newsome	Active	e-mail as needed	Intercity Transit	Vanpool Manager	Olympia, WA
Gary Kretchik	Active	e-mail as needed	UAA	Professor	Anchorage, AK

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Vanpool Council	Active	provide update as part of regularly scheduled meeting agenda. No other communication should be necessary.	Association for Commuter Transportation	Council	Misc
Association for Commuter Transportation	Inactive	e-mail if needed	ACT	National Industry Partner	Misc

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Transportation Research Board	Inactive	none.	TRB	TDM Committee	Washington, DC

Phil Winters	Active	e-mail and phone accepted	Center for Urban Transportation Research	Executive Director	Tampa, FL
Dr. Jim Dix	Active	text and phone are preferred. Send all survey requirements to personal e-mail along with a text to ensure it is read.	Brain surgeon, inventor, and researcher	Research Outcomes Partner	Austin, TX

Dr Erick Goldstein	Active	text and phone are preferred. Send all survey requirements to personal e-mail along with a text to ensure it is read.	Paul Hertz Group	Lead Researcher/vRide partner	Miami, FL

Luanna Huber	Active	e-mail through assistant Barbara for all meetings. Send updaetd through e-mail directly to Luanna.	Walt Disney Coproration	Rideshare Manager	Anaheim, CA

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Public Policy Committee	Inactive	e-mail if required	ACT	Committee of the Board	Misc

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Sharilyn Mumaw	Inactive	e-mail is necessary. IRB submittals should be only required communication.	UAA IRB Dept	Compliance Officer	Anchorage, AK
vanpoolers	Inactive	none	various	commuters	various

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Survey Respondents	Inactive	confidential survey mechanism	Respective Companies	Vanpool and SOV commuters	California
Kristina Valenzuela	Inactive	e-mail or phone call	Cal Tech	Rideshare Manager	California

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John Miranda	Inactive	e-mail and through vRide Account Manager Wendy Kim	JPL (Jet Propulsion Labs)	Rideshare Manager	California
Michael Alba	Active	e-mail	LinkedIn	Transportation Director	California
Tom Harrington	Active	e-mail	Intuit	Director, Transportation Services	California

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External Stakeholders (external to performing organization)		preferred communication method	Organization	Position/Title	Location

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Stakeholder Register

ation		Assessment Information (Their project requirements and expectations)					Classification (Their relationsh	
Role	Contact Information	Major requirements	Measures of Success	Expectations	Primary Concerns	Other helpful info	Classification (1-consult, 2-inform 3-consider)	Current Level of Support
Project Sponsor	ann.fandozzi@vride.com	Vanpool Based Research to begin vRide's provision of empirical data to the industry.	Execution and acceptance of Project by PM686A, ability to continue with other aspects of job, achieve vRide goals in addition to project goals.	Completion of research in 2015 to have data to present in 2016 at relevant conferences	Current customers are not affected by this additional work, expansion and growth for contracts is sustained	Organizational restructuring underway (private) must keep those aspects and deadlines in mind, and alter the project schedule as needed.	1	Approves project resources as necessary to meet project and organizational goals.

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Immediate Supervisor	jon.martz@vride.com	Ongoing updates of project progress and updates on interaction with other work requirements.	Ensuring stakeholder group is communicated with regularly, and satisfied at completion of project. All other duties continued to be executed, and attainment of organizational growth goal.	Completion of Masters Program while delivering compelling vanpool based research. Weekly status updates to ensure all organizational and project needs can be effectively met	Project success cannot come at the expense of organizational goals.	Both the organizational goals and the research outcomes are important. The schedule must be balanced constantly. Acceptable shifts in the schedule will be necessary.	1	SME and the only only subject referenced in literature review with historical knowledge of vanpool inforamtion. Given the role of immediate supervisor, has the ability to change organizational demands to other members of team as necessary.

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Colleagues	Misc	An update after analysis is performed before work is published to understand if questioned.	Up Front understanding of results and knowledge before general public, professional courtesy.	None currently. Will have expectations of open communication once findings begin being presented externally.	vRide's reputation is intact, including their ability to express outcomes effectively.	At worksites across many time zones.	3	None
Colleagues	Misc	quantifiable statistical outcomes specific to vanpooling	Ability to use reserch in future obligations.	statistically sound research	the data set will not deliver their expected results.		3	None. Could provide SME assistance for data analysis.
Research Assistance	jack.gallagher@vride.com	At my disposal for ongoing questions regarding the formulas that were created for the anslysis of the data.	Data sets that are functional and able to se analysed.	Minimal involvement, only during data anslysis.	None		2	Have conference calls and teamviewer meetings as necessary to keep data intact and confidential.

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Role	Contact Information	Major requirements	Measures of Success	Expectations	Primary Concerns	Other helpful info	Classification (1-consult, 2-inform 3-consider)	Current Level of Support
Primary Advisor	rkhull@uaa.alaska.edu	Communication throughout project, with updates and opportunities for contributing to final outcomes. On time submission of all PPM deliverables.	Follow through with planned communications as well as PPM submittals per schedule.	Regular updates per the communication plan. Incorporation of changes as discussed to maximize the outcomes of the project and submission materials.	All angles of possible outcomes have been considered. Statistical methodologies are appropriate for type of research.	Has experience in transportation projects, and great expereience with MS Project	1	Main advisor, high level of interaction.

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Committee Member	lpiccard@uaa.alaska.edu	Bi Weekly meetings to discuss project updates and convey alternatives. On time submission of all PM deliverables.	Completion of all scheduled project meetings. Conformance to requirements of PPM. Satisfaction of Stakeholder group as defined in the PMP.	Ongoing awareness of IRB requirements and deadlines. Written project updates every other week in addition to logged communication.	Stakeholder group is wide enough to include all possible outcomes, and those whom the outcomes may affect.	Has strong expertise in stakeholder management as well as PMP documentation. SME for project related deliverables.	1	Regular scheduled communications as well as quick responses to individual questions.

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Committee Member	sdkim@uaa.alaska.edu	Communication throughout project, with updates and opportunities for contributing to final outcomes. On time submission of all PPM deliverables. Bi Weekly written Project Update	Completion of all scheduled project meetings. Conformance to requirements of PPM. Well researched literature review for paper, as well as well thought out survey questions and structure.	Involvement in research design approval, ongoing open communication, high level of project attention to detail and scope	That the research is well thought out so that no revisions are necessary down the line.	Has a lot of past and current experience in transportation research. Will provide SME info for research base.	1	High, fast response of questions. Quick turnaround of project docuements. Seems to be the fastest to respond, helpful in tight schedule issues.

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gatekeeper /TRB publication partner	ddeming@law a.org	Finalized copies of research questions in advance of survey activation	Inclusion in survey and future research analysis	Communication when needed to design IRB methodologies as well as survey	Privacy and Confidentiality of employee base is paramount.	Will eventually provide co-research activities once information has been scrubbed of PI information.	1	Gatekeeper only in this phase of project. During 686B will rise to weekly updates and work package activities as an assigned resource.

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ACT Vanpool Council Chair	cnewsome@intercitytransit.com	High level detail of the survey information, with only enough detail to provide suggestions of possible questions	Informed updates according to Vanpool Council meeting schedule of every other month.	Participation and update to the Council during Council calls in addition to my regular PPC updates.	That the research is narrow enough to be effectively surveyed and sample set large enough to deliver statistically relevant data.	Carolyn directs a vanpool program, and would understand how the questionnaire will be received by the respondents.	2	Responsible for setting up Council calls. Will add my updates to the agenda.
Statistics support	gkretchik@juno.com	Involvement at the time of survey development (to determine statistical validity) and during statistical analysis	No fewer than two interviews during the project, and more as needed.	Involvement in survey analysis and statistical assistance. Potential research assistance if schedule requires based on shifting needs of the internal organization.	The survey is designed and sampled at a level that provides common statistical mins and norms: CI and Signifiganc e	Was willing to serve as committee member, reserving that role for future revision if necessary.	2	Infrom only until participation is required

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SME Support	Misc	Updates during bi monthly meetings as called by the Chair	Quantifiable data for future use and to build upon	execute a sound research project that delivers baseline vanpool specific results	initial survey will not show statistical significance	This group includes competitors. Their involvement may seek to harm project, consider the source of any input.	3	low
Future Partner	Misc	Receive final outcomes in the form of a conference presentation	Ground level vanpool research	Information can be used by members to help promote vanpooling.	Time PM spends on project will take away from other Council duties	Seeking to start a certification program with a vanpool track. Could be a future use of research (this and future).	3	None

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Peer Review Research Base	Misc	Vanpool Specific research to use in in future research by members.	statistically significant results produced in a quality report submitted for TRB review.	Submission of findings for peer review	To obtain vanpool specific research for the industry since vanpool is typically lumped together with carpool.	TRB TDM is intersted in vanpool specific info, which when produced by vRide could deliver significant insight into the VP mode.	3	none

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Advisor	winters@cutr.usf.edu	Ongoing communication throught project with some approval criteria (for survey as defined by Martz in Change 001)	Vanpool specific research delivered in a well written research paper, eventually to be submitted to TRB for publishing.	approval authority for survey questions (before IRB submittal)	The statistical analysis does not deliver meaningful results.	Considered a laeding authority in transporatio n research. Initial interviews reveal no one he is aware of to be doing any research like this.	1	Medium during survey, low during execution and close of contract.
Consultant	PRIVATE	Consultation as needed	None	None	Provide expert respurces	None	2	low

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Consultant	PRIVATE	Ongoing consideration and input through all phases of survey development through to publication of results as directed by PS.	Compelling data specific to vanpools to be used in future discussions with vRide leadership.	e-mail and text communication without having to ask for progress.	the survey is more narrow than he would like but understands the purpose of this particular exercise to keep it controllable for one researcher.	Could use this is platform to initiate in house research arm to determine market trends and needs specific to our mode.	1	medium throughout project.

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Mentor, SME	PRIVATE	Determining these. Follow up meeting scheduled 2/21	same	same	same	same	2	unk

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possible threat	misc	have project move forward without competing with resource commitment to Federal Requthorization	Ability to receive timely assistance with new legislation as it develops	Minimize impact to committee and to Vanpool Council in carrying out of the project work	Reauthorization will begin which requires resource assignment (PM) to other duties.	External forces and Federal legislative willingness to start the reauthorization is a known risk. New resources will need to be identified to carry out the research if the risk is realized, requiring PS approval.	3	None

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IRB approval Gatekeeper	907-786-1099	Well defined professionally presented IRB submission	complete accurate data without providing unnecessary detail	Receipt of Hum Research based IRB submittal to review and process	Inadequate submittal, portions that will not be approved based on type of research.	Long time institutional employee (University and Government)	3	low, and only at beginning of project. Once IRB is approved no more inpur required
End user	various	survey output that could help define the quality of life improvements of utilizing vanpooling.	Survey results that will assist in expansion of vanpooling at employers, and the hope of expansion of local subsidies in the long terms to support	none	Information will be beneficial to employers seeking to offer the service, and not detrimental to their use of the service.		3	Unaware

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Survey participants	private, confidential	easy to follow survey that delivers helpful insight into their driving behaviors and how that might translate into quality of like benefits	User friendly interface and follow through with reward scenarios if offered	minimal intrusion on daily life	confidentiality of information so individual data cannot be given back to employer and used against them.	Used to doing commute surveys, part of annual Air Quality Management District requirements.	3	Unaware
Employer Representative (Employer Two)	private	Advance copy of survey, sample e-mail to send to potential respondents	outcomes that deliver helpful insights into employee commute behavior	an executed survey without internal assistance and a copy of the final	Employees are not unduly interrupted. Personal information is kept confidential.	Kristina and Devon work together on the ACT So Cal Chapter Board. May have oppotrunites for joint in person meetings.	2	low, and only during survey execution.

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Employer Representative (Employer Three)	private	Advance copy of survey, sample e-mail to send to potential respondents	outcomes that deliver helpful insights into employee commute behavior	an executed survey without internal assistance and a copy of the final	Employees are not unduly interrupted. Personal information is kept confidential.	Wendy Kim should be primary contact	2	low and only during survey execution.
Employer Representative (Employer Four)	private	Advance copy of survey, sample e-mail to send to potential respondents	outcomes that deliver helpful insights into employee commute behavior	an executed survey without internal assistance and a copy of the final	Employees are not unduly interrupted. Personal information is kept confidential.	Wants individual survey info specific to his site.	2	low and only during survey execution.
Employer Representative (Employer 5)	private	Advance copy of survey, sample e-mail to send to potential respondents	outcomes that deliver helpful insights into employee commute behavior	an executed survey without internal assistance and a copy of the final	Employees are not unduly interrupted. Personal information is kept confidential.		2	low and only during survey execution.

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Role	Contact Information	Major requirements	Measures of Success	Expectations	Primary Concerns	Other helpful info	Classification (1-consult, 2-inform 3-consider)	Current Level of Support

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ip to and ability to impact project)			CHANGE REQUEST (Date and action)
Desired level of support	Key influencers /relationships	Other helpful info	Stakeholder affected by change or who initiated it
Prefers minimum day to day involvement, but willing to respond quickly when resources are required.	Open and approachable. Ready to assist if needed, but should be dedicated to organizational needs.	Prefers 3 bullet point e-mails or text only, brevity always preferred.	C4

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Very interested in the ongoing weekly progress of the project understanding the greater needs of the other organizational components. Wants weekly commuication or earlier if required.	Work on both the Vanpol Council and the Public Policy Committees will provide valuable insight, and could assit in identifying additional companies for survey if two cannot be secured initially.	Given the political climate, if the transportation bill is realistically given traction there may be a need to suspend the project at the given phase gate, until the bill is resolved. Reauthorization is the only organizational need higher in influence than the project and research.	PPM2: 2.15.15 include demographic information in survey. Accepted.

None, until PM686B is closed and information becomes public. Then will want communication as needed.	May have access to knowledge of events where this information would be useful.	Could use individual employees as SME if a certain situation requires it.	
None	Separate new entity for all emerging technologies for company	PRIVATE, requires consideration throughout development of paper.	

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Desired level of support	Key influencers /relationships	Other helpful info	
Prefers project updates every other week, and impromptu meetings during office hours. Scheduled regular meetings are not a preferred use of his time.	Influenced by the number of other projects he is serving on the committee for. Must consider his time constraints along with making sure this project remains a top priority.	Provides the thought processes to ensure all aspects have been considered. Not expected to incorporate all suggestions, just rationale as to why chosen.	

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Balance this project against the rest of her class load. An appropriate level of support for the scope of the project, and no more.	Director of the program.	Expressed her opinions of her strengths and those of the other committee members to help guide directed questions to the best qualified individual.	

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To the level appropriate for this project vs total portfolio. Has expressed a desire and interest in assisting with the project due to the topic and unique nature of the research.	Vast experience with statistics and research.	Interest in transportation research.	

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Inform initially, and then shift to partner communicati on and inclusion in all ersearch related decisions and activities.	Highly influential in the So CA market, would have access to other potential employers. Currently has executive support for participation in survey and resultant analysis.	Has participated in previous research for LAWA specific employee commute and transportati on data. Will use published report as a resource and possibly a cited source.	C3: Accpeted See PMP

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Continuing at the current level.			
Involvement during statistical analysis and development.			C6 Accepted: See PMP

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low	several potential SME		
None	PM is Board Member and Public Policy liaison for Vanpool Council.	President has so far been helpful and understands taking a step back on some Board related duties due to the ground breaking nature of this study.	

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none	TRB Rural Committee is also interested.	Likely for 2017 TRB submission based on their timelines. May have to present at ACT conference before then. Decision outside scope of current project, but should be considered.	

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medium, and only at survey developmen t phase. Alternatively , CUTR can be named a co publisher of the paper in exchange for a higher level of support as well as payment from vRide (would require PS approval).	Would like to use published results as baseline for future studies.		C1 Accepted: See PMP

meduim throughout project.	Advisor to PS	SME highly experienced in human behavior and trends. Will provide an excellent respurce for survey methodology and support.	C5 Accepted: See PMP

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unk		Luanna is very busy and after initial discussions is deciding on the level of input she can provide. As a member of the TRB her input would be valuable, and Disney could be a future survey location.	C2: Unaccepted, see Lessons Learned Log and PMP.

None	Political will to dig into how to pay for the new authorization and political climate at the time will drive their agenda.	There may be a hybrid of resource allocation and PM work on PPC may be limited due to shift in other resources to the PPC as opposed to shifting PM to work on PPC initiatives. Entirely dependent on current political will.	

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none		Keep in mind her name is listed on every research that has UAA ties, she will be monitoring the results accordingly.	
none	Current and potential customers		

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none			
low	partner and customer	When we discussed Cal Tech's Participation she decided their parent company would need to likely also be involved.	

low	partner and customer	JPL is parent agency of Cal Tech	C3: Accpeted See PMP

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Desired level of support	Key influencers /relationships	Other helpful info	

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Communication Register

Communication Register			
Agency/Organization Name	vRide Inc	Version Number	8
Project Name	Vanpool Research Project	Revision Date	11.30.2015

What?	Who?		When?	How?		
Information Requirement Description/Title	Provider/ Stakeholder	Recipient/ Stakeholder	Timeframe/ Frequency/Trigger	Format	Medium/Distribution Method	Storage/Disposition Method
Updates on Project Charter that require changes to budget or resource allocation	Crissy	Ann Fandozzi	As needed	e-mail no longer than one paragraph	e-mail Cc: Jonathon Clayton text is allowable for minor questions	Lessons Learned "Communication" File *Internal communications will not be archived in Project Materials
Progress Reports	"	Jon Martz	Weekly	Informal Update	Phone, text, or e-mail	"
Progress Reports and Material Discussions	"	Roger Hull	As needed	Informal Update	Phone or e-mail	"Lessons learned "Communication" File
Standing Meeting (verbal communication)	"	LuAnn Piccard	Every other Week	Conference call	Phone	"
Project Update	"	Dr. Seong Dae Kim	Every Other Week(686A) As needed (686B)	Word Document or e-mail	E-mail only (No Blackboard)	"
Survey Update	"	Carolyn Newsome	Every Other Month	Conference Call	During Vanpool Council Call	"
Survey Development and Research Components	"	Gary Kretchik	During Survey Development through to end of project	e-mail and collaborative online sessions	e-mail and GoTo Meetings	"
Survey Development and Research Components	"	Phil Winters	During Survey Development through to end of project including two interview sessions	e-mail and word documents	e-mail, and interviews will be performed in person at CUTR	"
Survey Implementation	"	Devon Deming	During survey development through end of project	Regular collaboration	e-mail, text, and phone	"
SME input and scope revisions directed from leadership	Dr Eric Goldstein	Crissy Ditmore	As developed	e-mail and phone	Phone or e-mail depending on suggested revisions	"

Survey Implementation	Crissy	Kristina Valenzuela	During survey development through end of project	Collaboration through survey implementation	e-mail or phone	"
Survey Implementation	Crissy	John Miranda	During survey development through end of project	Collaboration through survey implementation	e-mail	"
SME Input and TRB expectations	Luanna Huber	Crissy Ditmore	two interviews	Formal, in person	Once before survey is performed and once after draft paper is written	"
Survey Implementation	Crissy	Mike Alba	During survey execution	Collaboration through survey implementation, a copy of final results	e-mail as needed	*
Survey Implementation	Crissy	Tom Harrington	During survey execution	Collaboration through survey implementation	e-mail as needed, not required.	*
Data Analysis	Crissy	Jack Gallagher	Data aggregation, before running tests	e-mail, phone, and HAND DELIVERY of any PI source	As needed	On protected external hard drive only (outcomes)
Data Analysis	Dr. Jim Dix	Crissy	Research anomaly review	SME input to review validity of data due to anomaly	phone	Inclusion in final report

Requirements Traceability Matrix

PM 686B Ditmore | Vanpool Research Project | V.6

Requirement #	Source (Stakeholder Name or Group, Reference Document, etc.)	Stakeholder Register Reference	Requirement Description	Reserved	Project Objective Reference	WBS Reference	Acceptance Criteria	Validation method	Risk Register Reference	Notes	Results Achieved
1	Ann Fandozzi	4	Initial involvement in reasearch that provides vRide with increased industry status while not interfering greatly with the needs of the company in terms of growth and profitability during the project phase.		scope statement	1.1.2.1	Final survey methodology to be approved by Eric Goldstein	e-mail approval from Erick prior to submitting for IRB approval	n/a		
2	Jon Martz	5	Receive analzed survey results that can be used in future business decision making processes as well as presented by staff at industry conferences.		scope statement	1.1.2	statistically valid outcomes	peer review and approval	n/a		
3	PM686B Committee	18,19,20	Receive PPM Deliverables on time, per the requirements of the syllabus. Receive a final PMP that is thoroughly developed of professional quality and ready to move onto PM686B.		syllabus	1.1.1, 1.1.2	Grade of B or higher for all PPM's and final class grade	scores based on syllabus	n/a		

Key: M=Milestone
R=Risk
PS= Project Schedule

4	Devon Deming	21	Receive advance copy of survey questions to evaluate for appropriateness for employee involvement. Maintian employee privacy and confidentiality through survey methodology. Cooperate to provide access to employee base for survey implementation.		PMP Milestones	1.1.2.1.1,1.2.1.1.1.1.	IRB approval and Phil Winters approval	receipt of notice of approval and plans for Phase two	n/a		
17	Kristina Valenzuela	34	Maintian employee privacy and confidentiality through survey methodology. Cooperate to provide access to employee base for survey implementation.		PMP Milestones	1.1.2.1.1,1.2.1.1.1.1.	IRB approval	advance copy of plans for phase two	n/a		Would like to be considered for future research.
18	John Miranda (and any additional survey site contacts if identified later) [Mike Alba and Tom Harrington]	35	Maintian employee privacy and confidentiality through survey methodology. Cooperate to provide access to employee base for survey implementation.		PMP Milestones	1.1.2.1.1,1.2.1.1.1.1.	IRB approval	advance copy of plans for phase two	n/a		Would like to be considered for future research.
5	Carolyn Newsome	22	Project Updates to be provided prior to council meetings to update the rest of the stakeholder group on progress and survey methodology outcomes (Phase 1) and survey outcomes (Phase 2)		Stakeholder Register	1.1.2.1.1.	status updated provided one day prior to all meeting dates	PPC secretary notes	n/a		updates provided according to plan.

6	Gary Kretchik	23	Copy of anticipated survey measurement tools to be used and a copy of the final outcomes before analysis is completed to determine additional analysis tools.		Stakeholder Register	1.2.1.2.1	Information provided is fully developed	Peer review	n/a		Project Accepted
7	Vanpool Council	24	The most amount of vanpool specific research that still falls within the project scope.		Stakeholder Register	1.1.2.1.1.	Survey Output data statistically valid	TRB publication	R2		N/A
8	Association for Commuter Transportation	25	Access to final data in the form of future conference session presentations for use by members.		Stakeholder Register	1.3.2.	Receipt of final project report	TRB publication	n/a		N/A
9	Transportation Research Board	26	Well organized research with statistically valid analysis and professionally written paper findings.		scope statement	1.3.2.	Submission of report for publishing	TRB publication	n/a		N/A
10	Phil Winters	27	Draft copies of the survey questions prior to IRB submission. Opportunity to review survey findings prior to outcomes paper (Phase 2)		PMP C1	1.1.2.1.5.2	Fully developed surey draft methodology via e-mail	CUTR Peer review	n/a		Project Accepted
11	Dr Erick Goldstein	28	Involvement in decision of appropriate survey methodology to maximize results and utilize current enhancements of such in the existing marketplace. Research outcomes that provide empirical data for insight in vanpool commuter behavior.		Stakeholder Register	1.1.2.1.5.1	Final survey that incorporates his edits as agreed under the scope	Peer review	n/a		Project Accepted

12	Luanna Huber	29	Involvement in early discussions on survey development and research analysis tools. Advance copy of survey to determine additional needs. Pre scheduled meetings scheduled through Secretary. Face to face meeting prior to IRB submission.		Stakeholder Register	1.1.2.1.5					Project Accepted
13	Public Policy Committee	30	Active involvement in transportation requthorization that does not become diminished because of project duties and outcomes.		PMP	1.1.1.2.1.2.2	Ongoing participation in PPC calls	no unexcused absensces from committee calls	R3		N/A
14	Sharilyn Mumaw	31	Clear consise IRB submission that ensures the confidentiality and privacy of the survey respondents. Well articulated consent form and survey questions that are easy to understand and respond to.		PMP	1.1.2.2.4	Comprehensive IRB Submission documents	IRB approval	R1		Project Accepted
15	vanpoolers	32	Survey outcomes that will further their ability to use alternate transportation and potentially demonstrate a quantified benefit to employers for implemeting vanpool programs.		Scope Statement, Research abstract	1.1.2.1.1	Close of project that results in research paper	does not interfere with their ability to vanpool			N/A
16	Survey Respondents	33	A quick and easy survey tool that keeps their responses confidential.		PMP	1.2.1.1.	Update for anyone that requested follow up information after analysis	acceptance of survey findings	R4		N/A

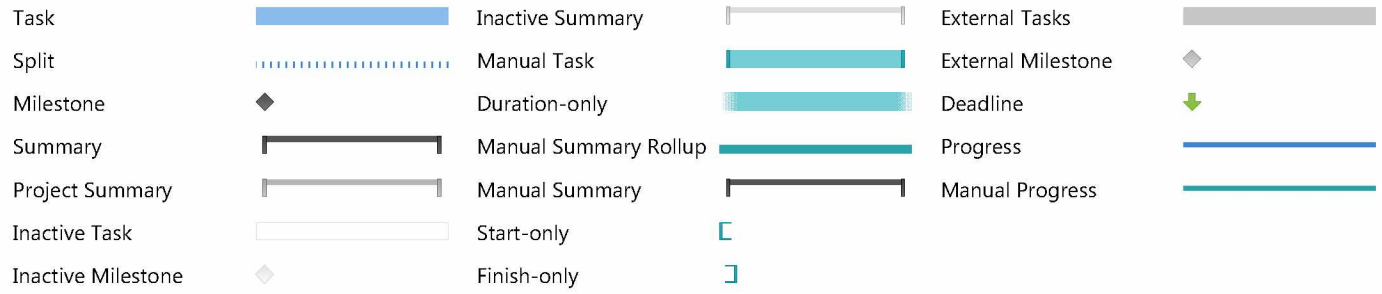
ID		Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
1	✓	**VANPOOL RESEARCH PROJECT**	**100%**	**Fri 1/16/15**	**$2,808.50**	**$2,808.50**	**$0.00**	**0%**	**1**	
2	✓	**686A PPM1**	**100%**	**Fri 1/16/15**	**$31.50**	**$31.50**	**$0.00**	**0%**	**1**	
3	✓	First Class	100%	Fri 1/16/15	$2.00	$2.00	$0.00	0%	1	
4	✓	Committee Interviews	100%	Fri 1/16/15	$2.00	$2.00	$0.00	0%	1	
5	✓	Committee Signature Aggreement	100%	Mon 1/19/15	$1.00	$1.00	$0.00	0%	1	
6	✓	Meet with IRB Advisor	100%	Tue 1/20/15	$2.00	$2.00	$0.00	0%	1	
7	✓	Martz Project Upate	100%	Tue 1/20/15	$0.50	$0.50	$0.00	0%	1	
8	✓	**686A PPM2**	**100%**	**Wed 1/21/15**	**$12.30**	**$12.30**	**$0.00**	**0%**	**1**	
9	✓	Class 2	100%	Wed 1/21/15	$2.00	$2.00	$0.00	0%	1	
10	✓	Public Policy Meeting	100%	Wed 1/21/15	$1.00	$1.00	$0.00	0%	1	
11	✓	Vanpool Council Meeting	100%	Wed 1/21/15	$1.00	$1.00	$0.00	0%	1	
12	✓	Create Stakeholder Register	100%	Thu 1/22/15	$3.00	$3.00	$0.00	0%	1	

Project: V6 Ditmore Project Gan
Date: Wed 12/9/15

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

ID	Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
13	Martz Project Upate	100%	Fri 1/23/15	$0.50	$0.50	$0.00	0%	1	
14	686A PPM2 Document Development	100%	Wed 1/21/15	$4.00	$4.00	$0.00	0%	1	
15	Committee Update	100%	Fri 1/23/15	$0.50	$0.50	$0.00	0%	1	
16	Submit 686APPM2	100%	Thu 1/22/15	$0.30	$0.30	$0.00	0%	1	
17	**686A PPM3**	**100%**	**Thu 1/22/15**	**$23.00**	**$23.00**	**$0.00**	**0%**	**1**	
18	Enhance KA Perf Measures	100%	Thu 1/22/15	$0.50	$0.50	$0.00	0%	1	
19	Develop Scope Change Management	100%	Thu 1/22/15	$2.00	$2.00	$0.00	0%	1	
20	Develop Requirements Tracability Matrix	100%	Mon 1/26/15	$4.00	$4.00	$0.00	0%	1	
21	Create Communication Register	100%	Fri 1/23/15	$4.00	$4.00	$0.00	0%	1	
22	Determine Acceptance Criteria	100%	Tue 1/27/15	$4.00	$4.00	$0.00	0%	1	

Project: V6 Ditmore Project Gan
Date: Wed 12/9/15



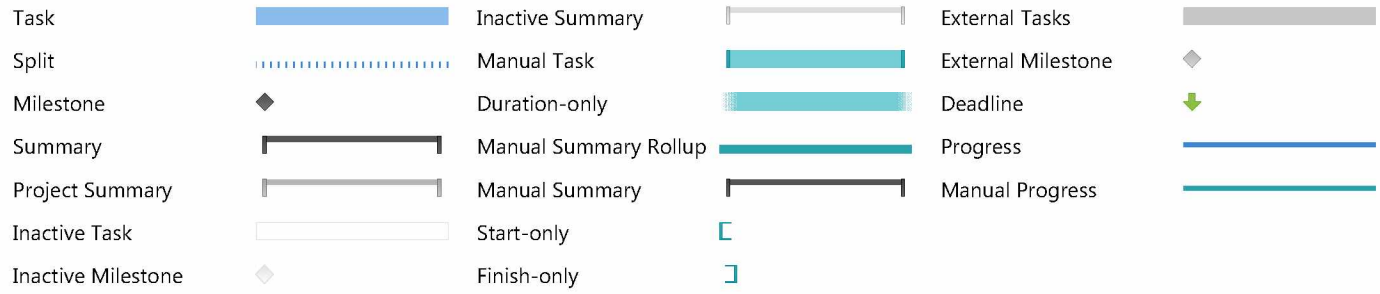
ID		Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
23	✓	Martz Project Upate	100%	Wed 1/28/15	$0.50	$0.50	$0.00	0%	1	
24	✓	LuAnn Project Update	100%	Thu 1/29/15	$0.50	$0.50	$0.00	0%	1	
25	✓	Committee Update	100%	Fri 1/30/15	$0.50	$0.50	$0.00	0%	1	
26	✓	Class 3	100%	Mon 2/2/15	$2.00	$2.00	$0.00	0%	1	
27	✓	Perform Literature Review	100%	Thu 1/22/15	$5.00	$5.00	$0.00	0%	1	
28	✓	**IRB Submission Development**	**100%**	**Mon 1/26/15**	**$82.90**	**$82.90**	**$0.00**	**0%**	**1**	
29	✓	UAA IRB Class	100%	Mon 1/26/15	$2.00	$2.00	$0.00	0%	1	
30	✓	Print Registration Screenshot	100%	Tue 1/27/15	$0.20	$0.20	$0.00	0%	1	
31	✓	Perform IRB Training	100%	Wed 1/28/15	$20.00	$20.00	$0.00	0%	1	
32	✓	Submit Training Certificate	100%	Fri 1/30/15	$0.20	$0.20	$0.00	0%	1	
33	✓	Develop IRB Submission	100%	Mon 2/2/15	$10.00	$10.00	$0.00	0%	1	
34	✓	Submit for IRB Approval	100%	Tue 2/3/15	$0.50	$0.50	$0.00	0%	1	

Project: V6 Ditmore Project Gan
Date: Wed 12/9/15

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

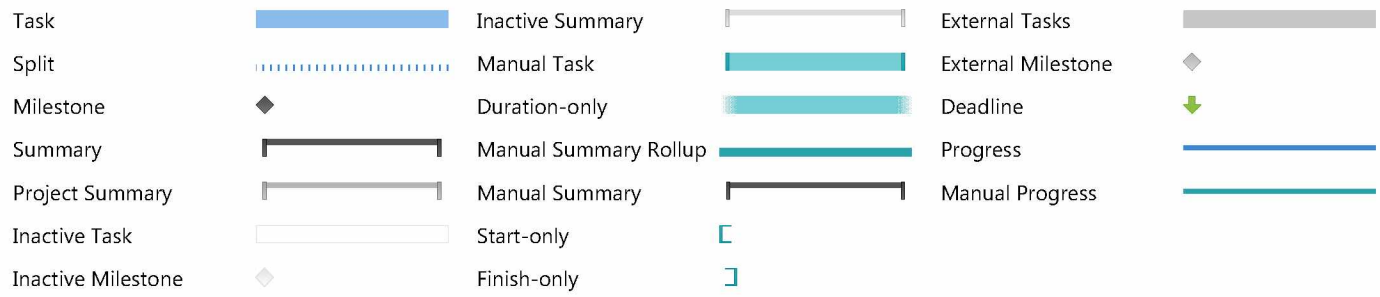
ID	Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
35	Address IRB Objections	100%	Wed 2/4/15	$2.00	$2.00	$0.00	0%	1	
36	**Survey Development**	**100%**	**Fri 1/30/15**	**$48.00**	**$48.00**	**$0.00**	**0%**	**1**	
37	Interview P.Winters	100%	Fri 1/30/15	$2.00	$2.00	$0.00	0%	1	
38	Interview E. Goldstein	100%	Mon 2/2/15	$2.00	$2.00	$0.00	0%	1	
39	Draft Review L Huber	100%	Tue 2/3/15	$4.00	$4.00	$0.00	0%	1	
40	Finalize Survey Questions	100%	Wed 2/4/15	$8.00	$8.00	$0.00	0%	1	
41	**686A PPM4**	**100%**	**Tue 2/3/15**	**$25.50**	**$25.50**	**$0.00**	**0%**	**1**	
42	Go/No GO Decision	100%	Wed 3/18/15	$8.00	$8.00	$0.00	0%	1	
43	686A Class Four	100%	Thu 3/19/15	$2.00	$2.00	$0.00	0%	1	
44	Update all Project Documents	100%	Tue 2/3/15	$10.00	$10.00	$0.00	0%	1	
45	Create Final Presentation	100%	Wed 2/4/15	$3.00	$3.00	$0.00	0%	1	
46	PPC Meeting	100%	Thu 3/19/15	$1.00	$1.00	$0.00	0%	1	

Project: V6 Ditmore Project Gan
Date: Wed 12/9/15



ID	Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
47	Martz Project Upate	100%	Thu 3/19/15	$0.50	$0.50	$0.00	0%	1	
48	LuAnn Project Update	100%	Fri 3/20/15	$0.50	$0.50	$0.00	0%	1	
49	Committee Update	100%	Mon 3/23/15	$0.50	$0.50	$0.00	0%	1	
50	686A Presentation	100%	Mon 3/23/15	$0.00	$0.00	$0.00	0%	0	
51	**Interview Employer Sites**	**100%**	**Mon 1/26/15**	**$61.30**	**$61.30**	**$0.00**	**0%**	**1**	
52	Site One (LAWA)	100%	Mon 1/26/15	$2.00	$2.00	$0.00	0%	1	
53	Site Two (Cal Tech)	100%	Mon 1/26/15	$2.00	$2.00	$0.00	0%	1	
54	Site Three (JPL)	100%	Mon 1/26/15	$2.00	$2.00	$0.00	0%	1	
55	Site Four (LinkedIn)	100%	Tue 2/3/15	$2.00	$2.00	$0.00	0%	1	
56	Site Five (Intuit)	100%	Tue 2/3/15	$2.00	$2.00	$0.00	0%	1	
57	**Implement Surveys**	**100%**	**Thu 6/11/15**	**$542.00**	**$542.00**	**$0.00**	**0%**	**1**	
58	Site One (LAWA)	100%	Thu 6/11/15	$14.00	$14.00	$0.00	0%	1	
59	Site Two (Cal Tech)	100%	Mon 6/22/15	$14.00	$14.00	$0.00	0%	1	

Project: V6 Ditmore Project Gan
Date: Wed 12/9/15



ID	Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
60	Site Three (JPL)	100%	Mon 7/6/15	$14.00	$14.00	$0.00	0%	1	
61	Site Four (LinkedIn)	100%	Mon 7/20/15	$14.00	$14.00	$0.00	0%	1	
62	Site Five (Intuit)	100%	Mon 8/24/15	$14.00	$14.00	$0.00	0%	1	
63	**Analyze Data**	**100%**	**Mon 9/7/15**	**$27.00**	**$27.00**	**$0.00**	**0%**	**1**	
64	Download/Uploa results from Qualtrics	100%	Mon 9/7/15	$8.00	$8.00	$0.00	0%	1	
65	Discuss initial data analysis with G. Kretchik	100%	Tue 9/8/15	$2.00	$2.00	$0.00	0%	1	
66	Provide Data to Research Assistant for development of formulas	100%	Tue 9/8/15	$4.00	$4.00	$0.00	0%	1	
67	Perform Confidence Interval Tests	100%	Wed 9/9/15	$5.00	$5.00	$0.00	0%	1	
68	Create Excel output views for final data	100%	Wed 9/9/15	$4.00	$4.00	$0.00	0%	1	

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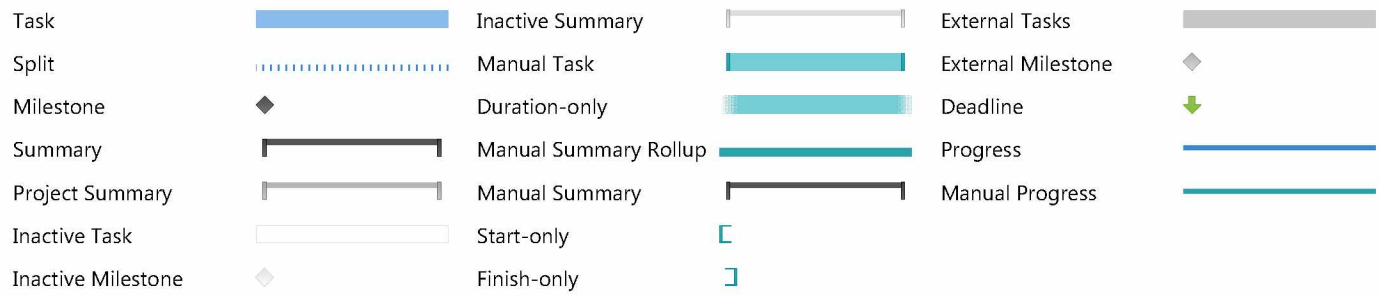

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69	Create Visual Representations for paper	100%	Thu 9/10/15	$4.00	$4.00	$0.00	0%	1	
70	**686B PPM1**	**100%**	**Wed 9/2/15**	**$27.50**	**$27.50**	**$0.00**	**0%**	**1**	
71	686B Class One	100%	Wed 9/2/15	$2.00	$2.00	$0.00	0%	1	
72	Committee Interview and Signatures	100%	Wed 9/2/15	$2.00	$2.00	$0.00	0%	1	
73	Update all Project Documents	100%	Wed 9/2/15	$6.00	$6.00	$0.00	0%	1	
74	D.Deming Project Update	100%	Wed 9/2/15	$0.50	$0.50	$0.00	0%	1	
75	Martz Project Upate	100%	Thu 9/3/15	$0.50	$0.50	$0.00	0%	1	
76	Luann Project Update	100%	Thu 9/3/15	$0.00	$0.00	$0.00	0%	0	
77	Submit PPM1	100%	Thu 9/3/15	$0.50	$0.50	$0.00	0%	1	
78	**Write Final Paper (Project Deliverable)**	**100%**	**Fri 9/11/15**	**$99.00**	**$99.00**	**$0.00**	**0%**	**1**	
79	Draft One	100%	Fri 9/11/15	$10.00	$10.00	$0.00	0%	1	

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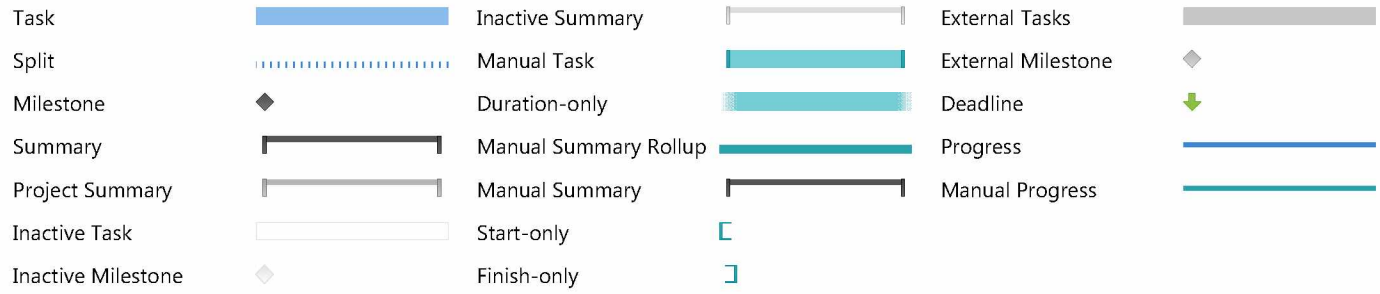

ID	Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
80	Create Outline and TOC	100%	Tue 9/15/15	$4.00	$4.00	$0.00	0%	1	
81	Draft Two including quotes from Literature Review	100%	Wed 9/16/15	$10.00	$10.00	$0.00	0%	1	
82	Draft Three finalized ready for Editor	100%	Thu 9/17/15	$10.00	$10.00	$0.00	0%	1	
83	Send Draft Survey to Editor For review	100%	Fri 9/18/15	$0.50	$0.50	$0.00	0%	1	
84	Editor Review	100%	Fri 9/18/15	$3.00	$3.00	$0.00	0%	1	
85	Finalize Report	100%	Mon 9/21/15	$6.00	$6.00	$0.00	0%	1	
86	Submit Final Report	100%	Tue 9/22/15	$0.50	$0.50	$0.00	0%	1	
87	**686B PPM2**	**100%**	**Fri 9/4/15**	**$4.00**	**$4.00**	**$0.00**	**0%**	**1**	
88	Committee Update	100%	Tue 9/15/15	$0.50	$0.50	$0.00	0%	1	

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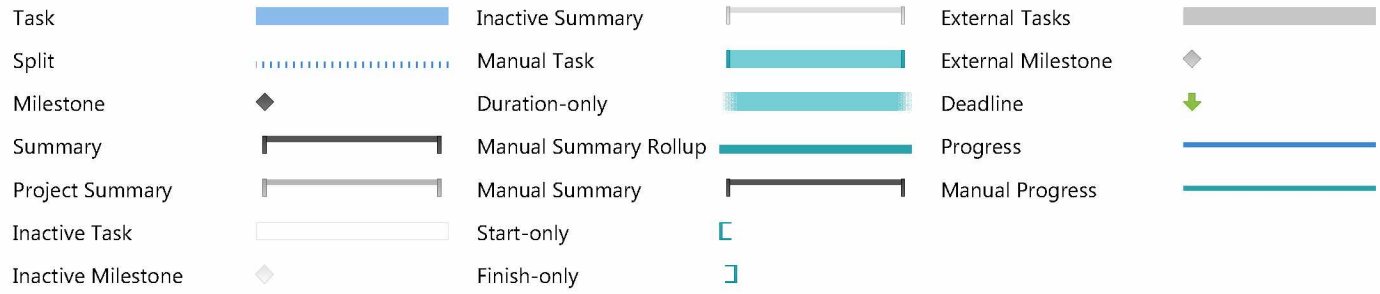

ID	Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
89	Update all Project Documents	100%	Fri 9/4/15	$2.00	$2.00	$0.00	0%	1	
90	Martz Project Upate	100%	Mon 9/7/15	$0.50	$0.50	$0.00	0%	1	
91	Luann Project Update	100%	Tue 9/8/15	$0.50	$0.50	$0.00	0%	1	
92	Submit all Required Updates including paper and Project	100%	Tue 9/15/15	$0.50	$0.50	$0.00	0%	1	
93	**686B PPM3**	**100%**	**Wed 9/16/15**	**$37.50**	**$37.50**	**$0.00**	**0%**	**1**	
94	Perform Stakeholder Survey	100%	Wed 9/16/15	$0.00	$0.00	$0.00	0%	0	
95	Update all Project Documents	100%	Wed 9/16/15	$1.00	$1.00	$0.00	0%	1	
96	686B GO NO GO	100%	Thu 9/17/15	$0.50	$0.50	$0.00	0%	1	
97	Class Three	100%	Wed 9/16/15	$2.00	$2.00	$0.00	0%	1	
98	Martz Project Upate	100%	Thu 9/17/15	$0.50	$0.50	$0.00	0%	1	

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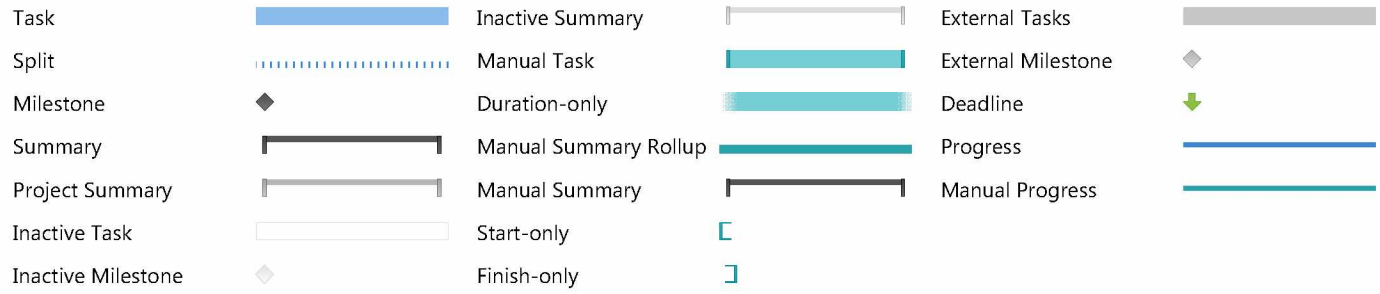

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99	Luann Project Update	100%	Fri 9/18/15	$0.50	$0.50	$0.00	0%	1	
100	Committee Update	100%	Mon 9/21/15	$0.50	$0.50	$0.00	0%	1	
101	Perform Stakeholder Survey	100%	Thu 9/17/15	$0.50	$0.50	$0.00	0%	1	
102	**686B PPM4**	**100%**	**Tue 9/22/15**	**$11.00**	**$11.00**	**$0.00**	**0%**	**1**	
103	Update all Project Documents	100%	Tue 9/22/15	$1.00	$1.00	$0.00	0%	1	
104	Martz Project Upate	100%	Wed 9/23/15	$0.50	$0.50	$0.00	0%	1	
105	Luann Project Update	100%	Thu 9/24/15	$0.50	$0.50	$0.00	0%	1	
106	Committee Update	100%	Fri 9/25/15	$0.50	$0.50	$0.00	0%	1	
107	Finalize Final Submission Documents	100%	Wed 9/23/15	$4.00	$4.00	$0.00	0%	1	
108	Create Final Presentation	100%	Thu 9/24/15	$2.00	$2.00	$0.00	0%	1	
109	Submit Final 686B Documents	100%	Fri 9/25/15	$0.50	$0.50	$0.00	0%	1	

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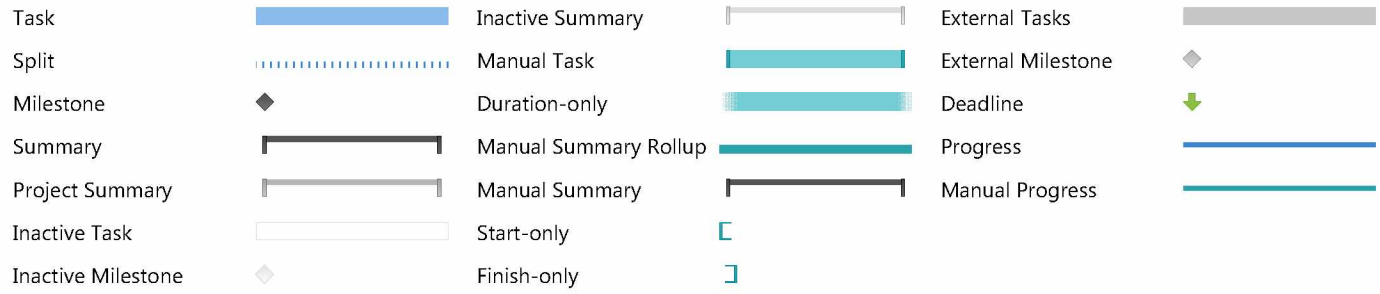

ID		Task Name	% Complete	Start	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	CV	CV%	CPI	Nov 9, '14 M
110	✓	686B Final Defense	100%	Tue 12/1/15	$2.00	$2.00	$0.00	0%	1	

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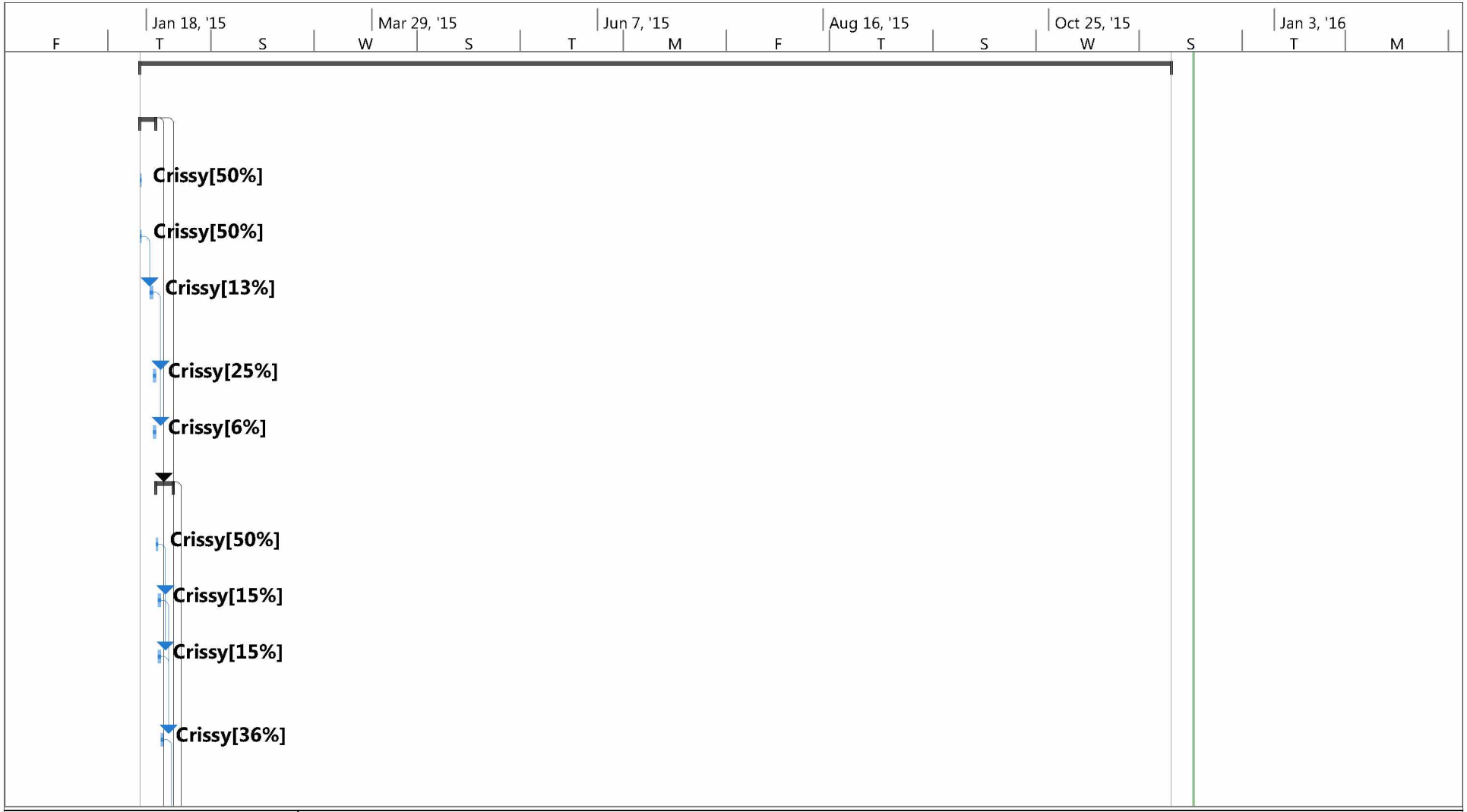
Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			



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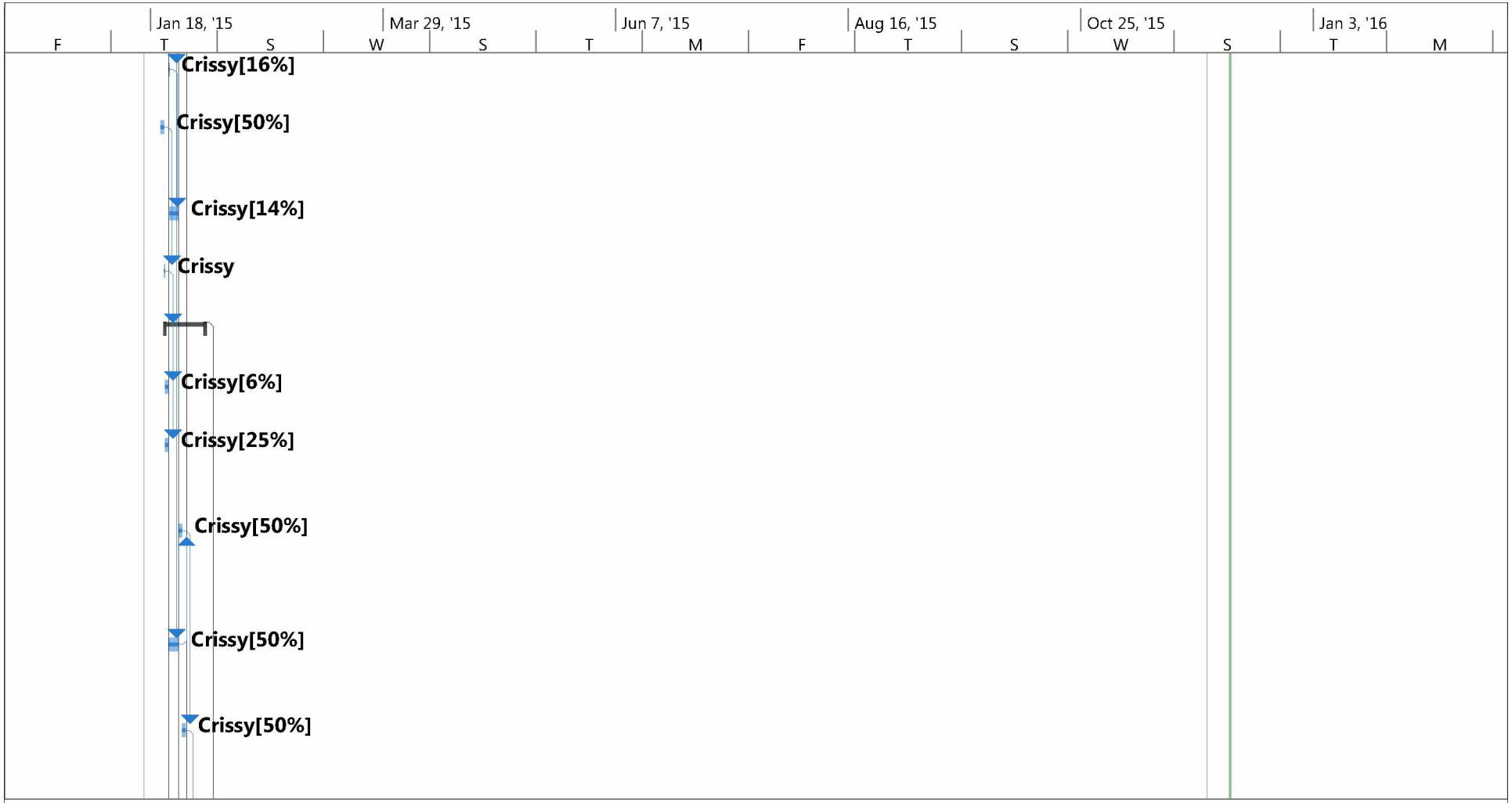

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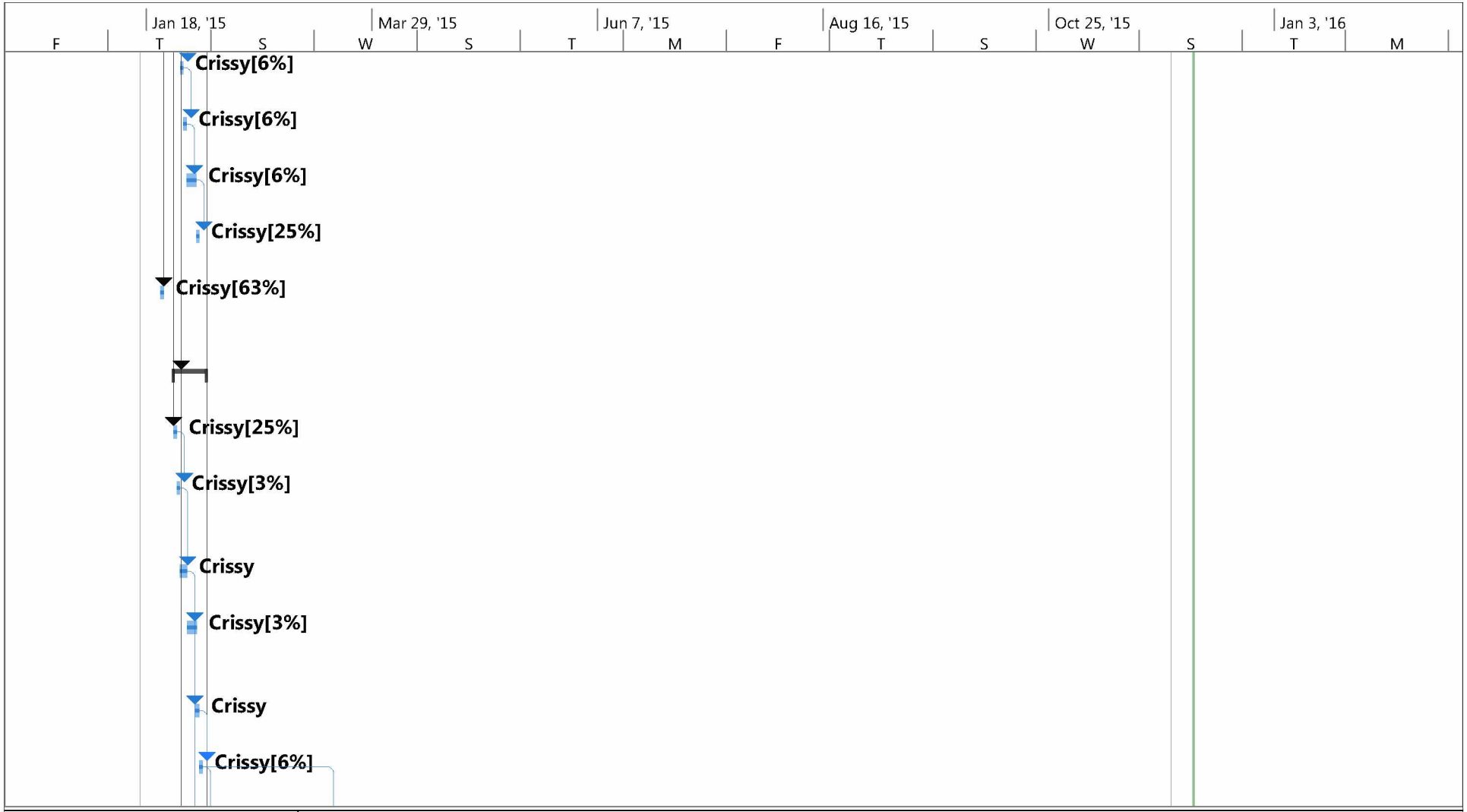

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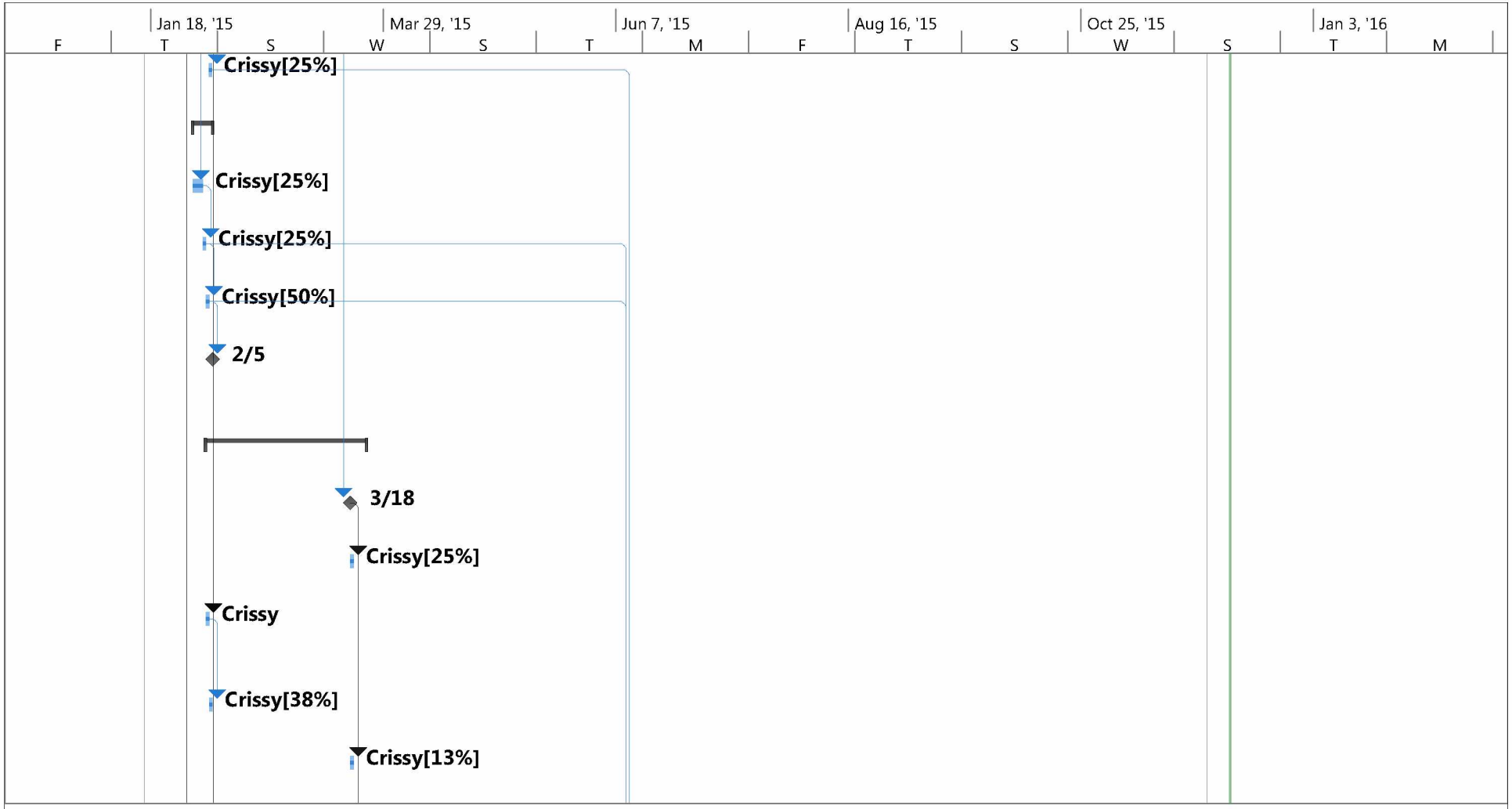

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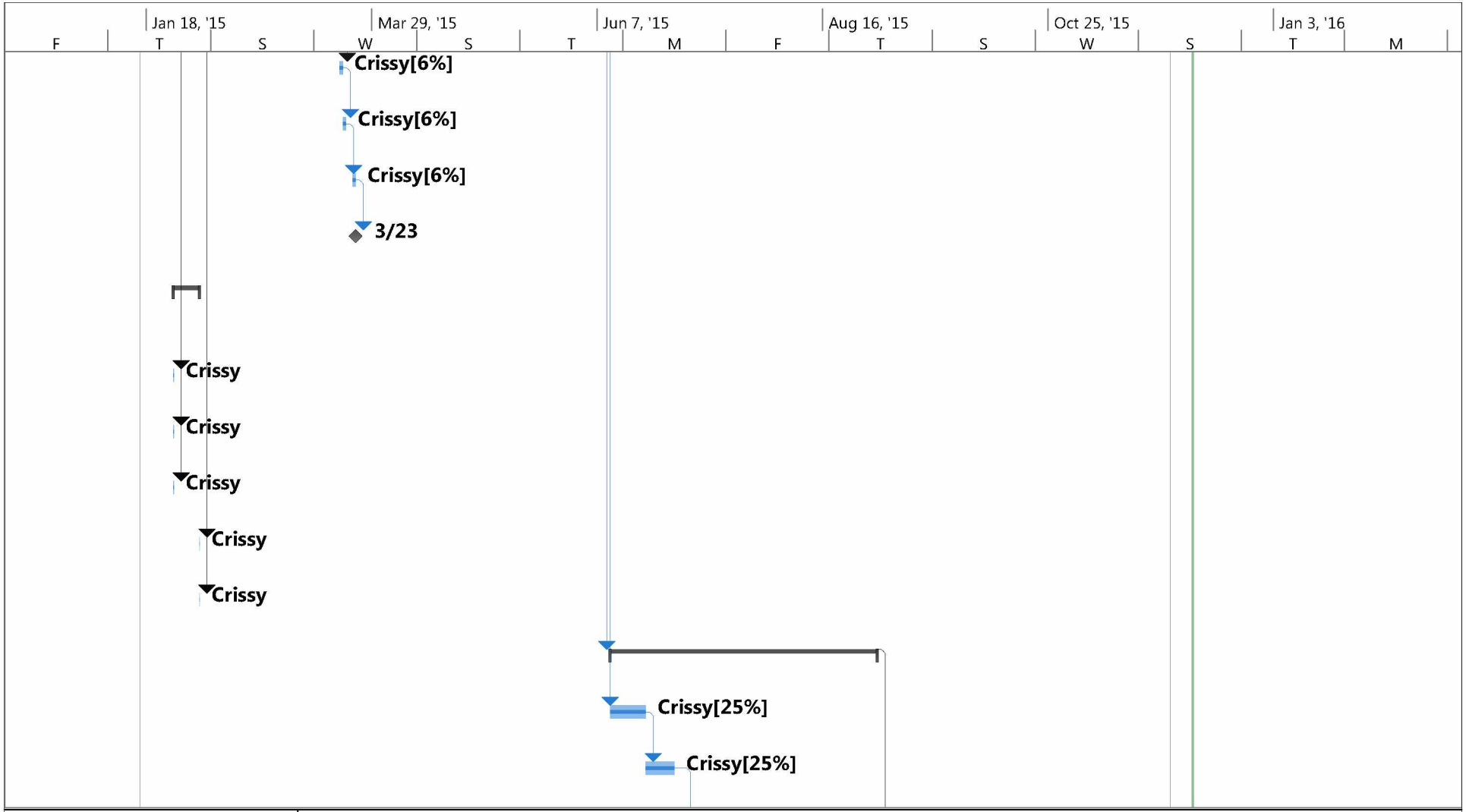

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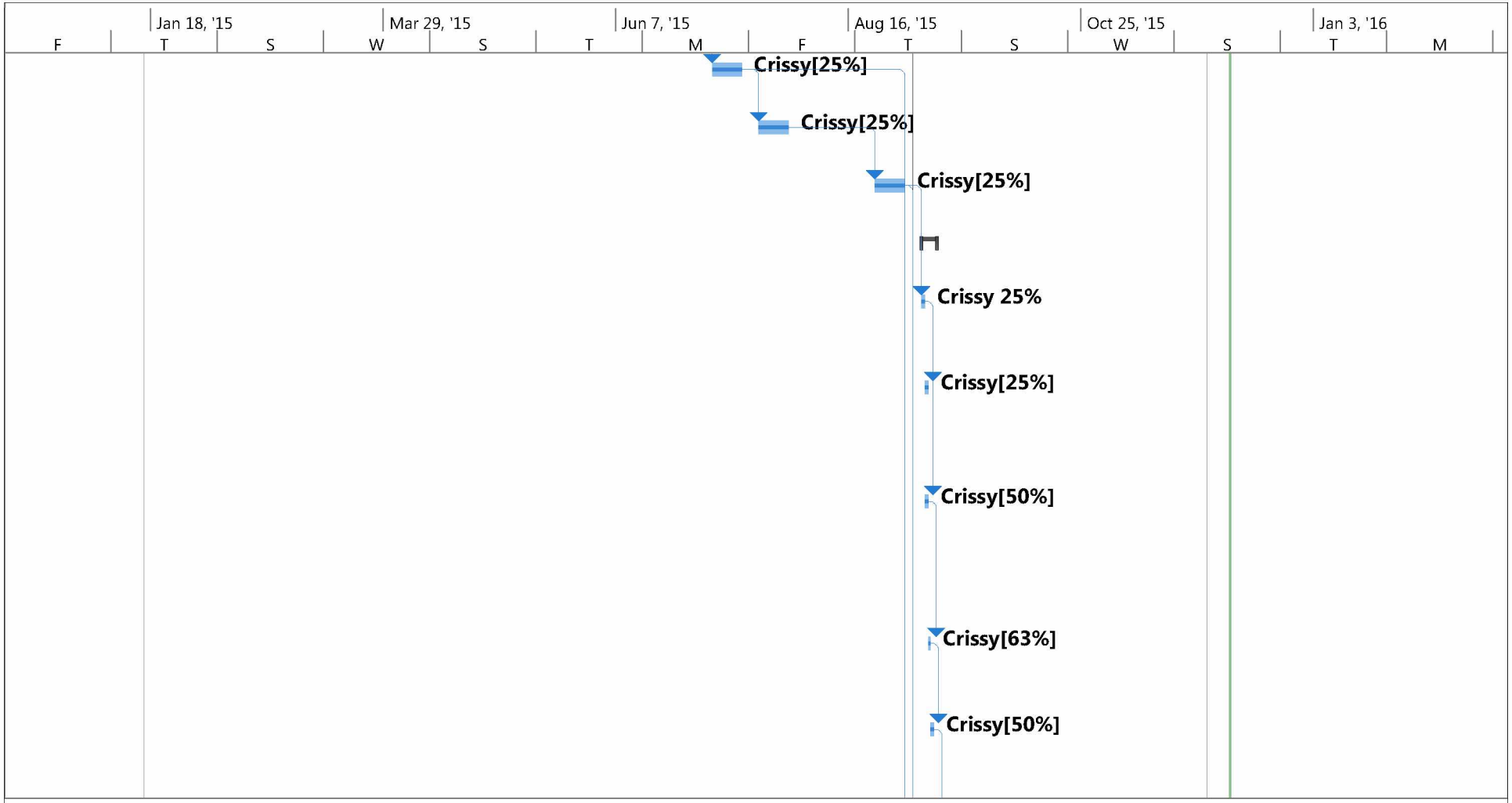

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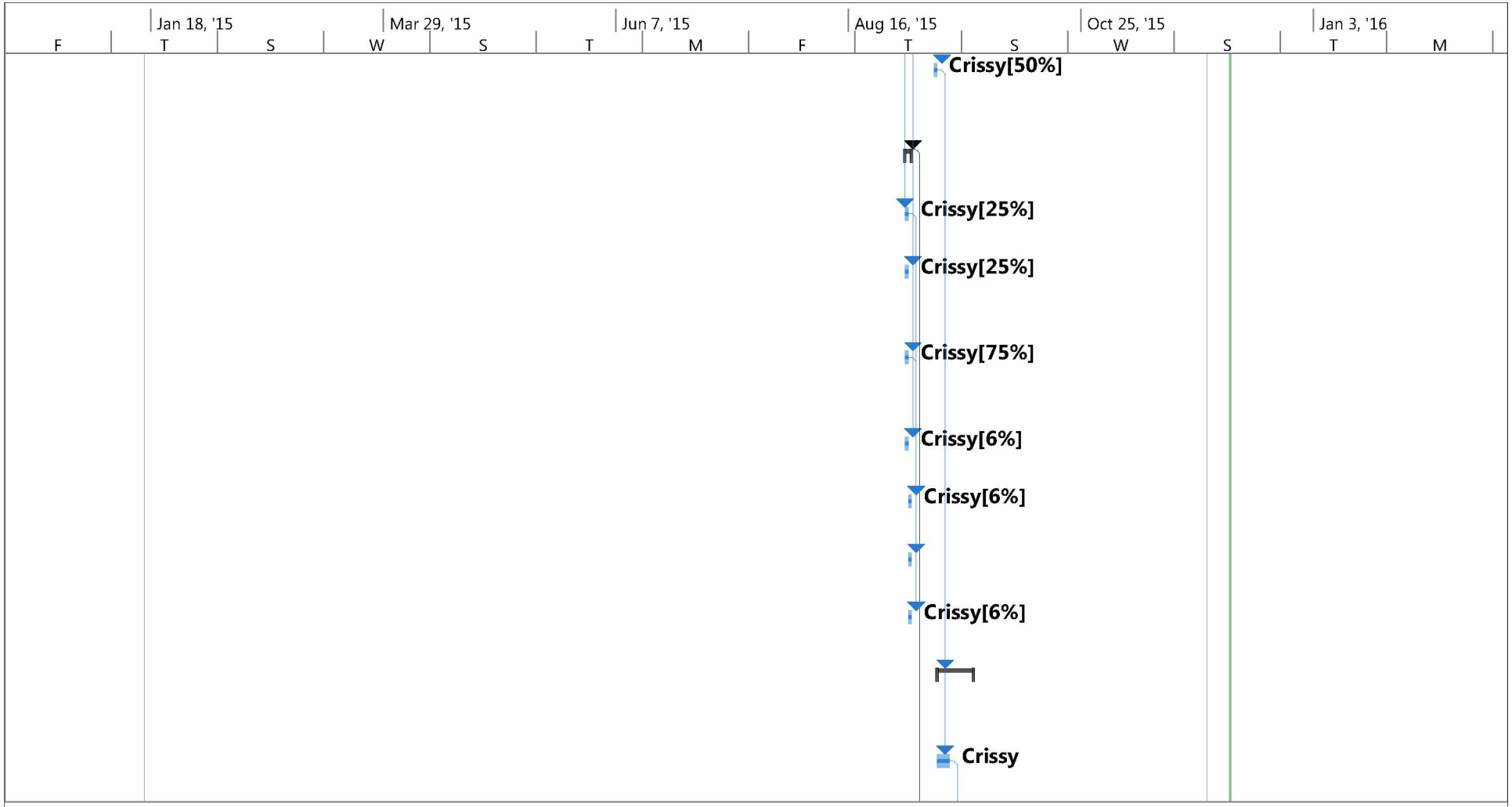

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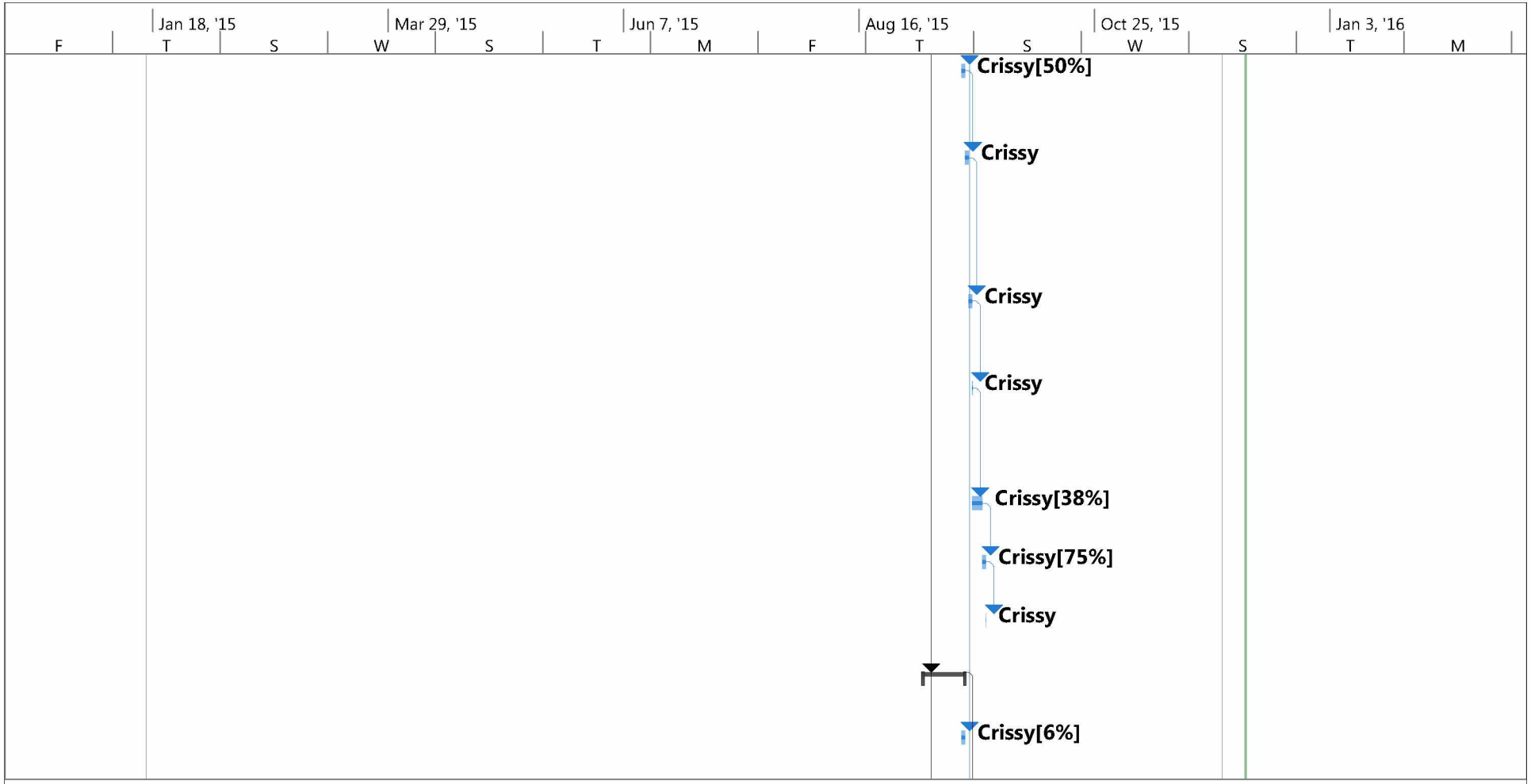

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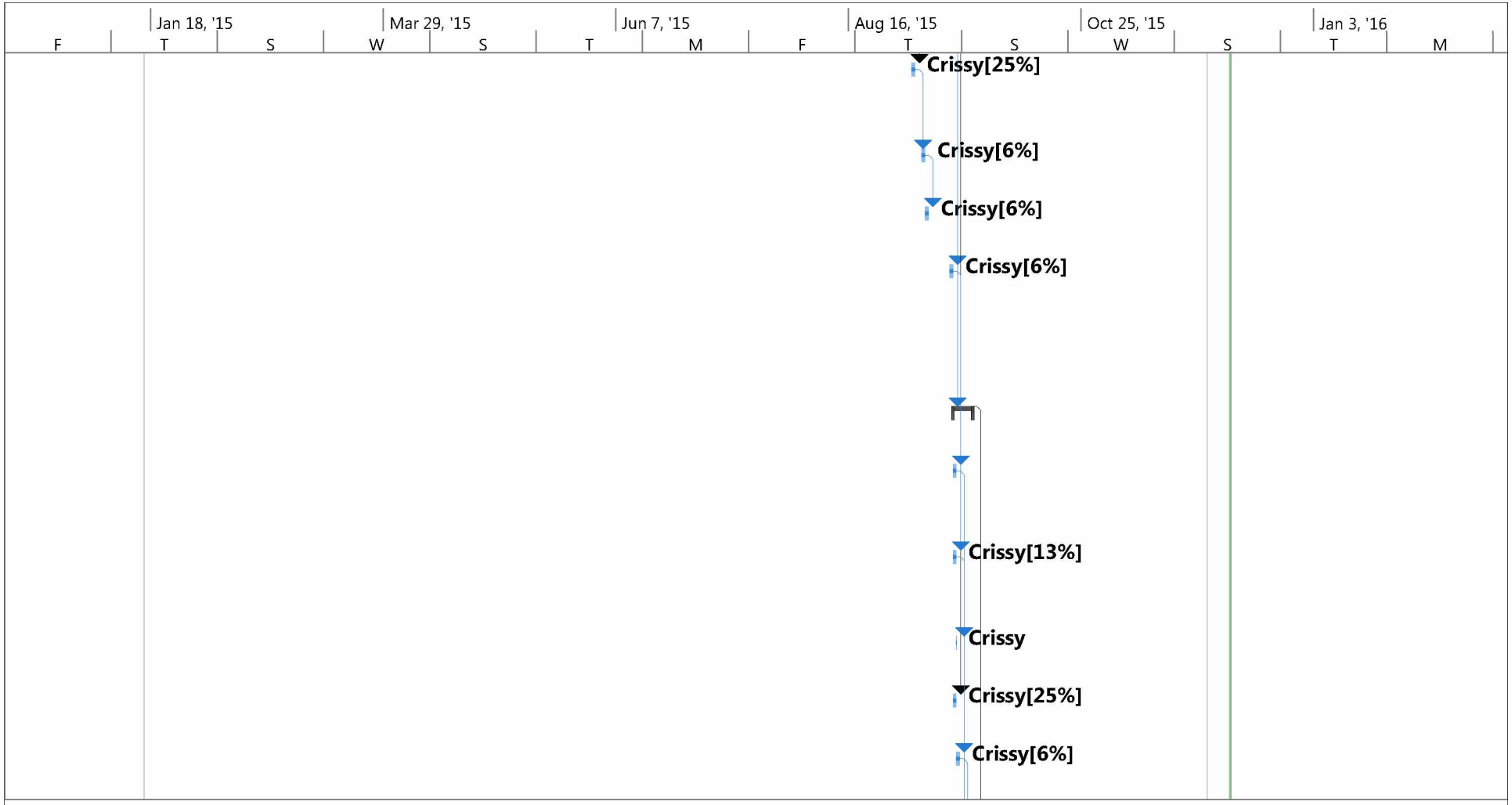

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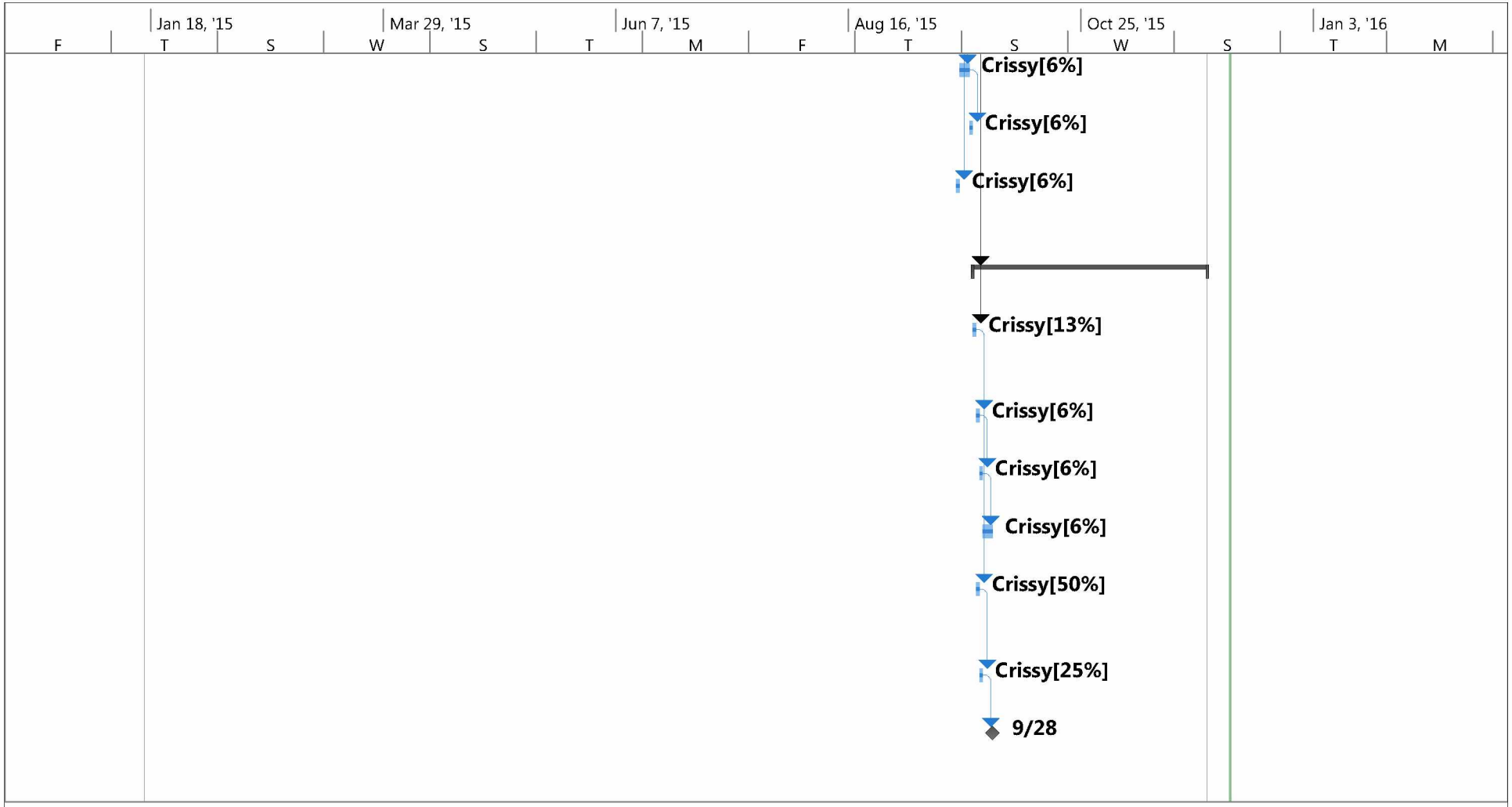

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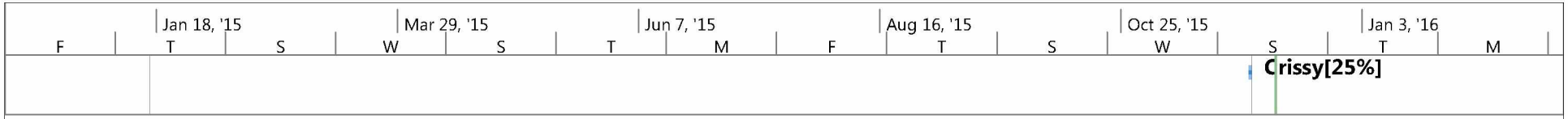

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COMMUNICATION LOG

Project Title: Vanpool Research Project **Edit Date:** 11.30.2015

Notes gathered from the stakeholder meetings throughout the project Started 2.5.15 as a result of Knowledge Area Performance factor criteria. Use to judge satisfaction from stakeholders active in the process. All members listed have granted permission to record the status updates and consequent actions. Only Level 1 and 2 stakeholders will have notes taken, unless project history would benefit from the note.

Stakeholder and Date	Notes	*Action items*/Result or Change
PPM1 PM686A		
Piccard 2.5.15	*Discussed meeting with IRB and next steps*	*Wants me to consider more of what would measure stakeholder satisfaction.* **Created the communication log to recall exact issues stakeholder identified. Will be used as a measurement tool.**
PPM2 686A		
Huber 2.6.15	*Discussed initial research process for TRB*	*Considering participating in a more active role. Will advise me of decision.* **Set up a follow up meeting through secretary.**
Deming 2.6.15	*Affirmed LAWA's participation in research and Devon's future assistance when we are ready for TRB publication*	*Send the initial survey questions for review to determine if any are already asked as part of their required employee commute survey (AQMD Requirement).* **Update Stakeholder Register to include LAWA.**
Martz 2.9.15	*Internal notes withheld. Wants to make sure Phil in on board with the need for demographic info as brought up by IRB. Discuss with Phil*	*Inclusion of info only affects scope of research, not scope of project and is in advance of IRB submission, so does not affect schedule, acceptable.* **Will discuss with Phil.**
Winters 2.11.15	*Thinks demographic info would be helpful. Wants to explore the use of a mobile application for the survey itself, but thinks I should offer a traditional method as well to expand the pool of respondents.*	*Wants me to send survey questions to him before submitting to IRB review. This will change the IRB review submission date in the schedule.* **Re assign IRB submission date in schedule, send survey questions to him for review in advance.**
Martz 2.16.15	*Short meeting, Martz travelling. Confirmed that I will send Winters questions before submitting for approval, and will include the demographic info we discussed.*	**Internal Action item 1. No further updates this week.**
Kim 2.16.15	*Update the WBS with explanation of the kinds of changes that should be made*	**Updated WBS, will wait for PPM2 feedback to see what further revision is necessary.**
Piccard 2.20.15	*Walked through traceability for project, created new headings for WBS, discussed class A deliverables, suggested using the process as more of a learning process instead of a deliverable based process.*	**Updated Traceability and WBS, added a section to lessons learned for stakeholder suggestions for future use.**

COMMUNICATION LOG

PPM3 686A		
Huber 2.25.15	*Discussed the ongoing needs of the project, and reviewed the specific questions needed for the survey. Discussed the concepts of the Capstone project in conjunction with the research to be performed. Discussed the future needs of the outcomes, and suggested alterations based on the ongoing needs of data sourcing.*	**Would like to involve carpool data in addition to vanpool data.** *Request denied, out of scope of this project. Included in the lessons learned repository for future use.*
Kim 2.27.15	*E-mail correspondence with several more updates to the WBS.*	**Further refined WBS. Still thinks it is too wide, would like to consider continued revision.** *Will discuss with R.Hull needed revisions.*
Martz 3.2.15	**Meeting not held, Martz traveling**	
Piccard 3.5.15	*Phone call to discuss specifics of IRB and to confine to scope of this project only. Discussed the requirements of the IRB and the requirements of the Capstone deliverable. Discussed new submission timeline as well as initial review by S.D. Kim in advance of posting to IRBnet.*	**Honed in the requirements of the IRB. Provided a sample from a previous successful submission which can be used as a guideline.** *Will complete the draft IRB submission in word form first, and send to Dr Kim for review before submitting for final approval.*
Martz 3.9.15	*Face to face meeting to go over all project documents to date and confirm schedule. Discussed the limit for the incentive gifts, and determined we would offer five opportunities for winning based on survey participation.*	**Decided of a limit of $2,000 for the purchase of survey incentives.** *Will offer a total of five prizes to randomly selected respondents. They will be able to choose from either a Apple iPad or a $300 VISA Gift Card.*
Piccard 3.12.15	*Brief Call to discuss the IRB submission going to Dr Kim before submitting to IRB*	**Will plan on submitting to Dr Kim first.** *My recent adding of the committee members to the view only status of my project prompted her to call to make sure I was going to submit to Dr Kim. That has been the plan, and the addition of the committee members was for their information only. I expect only Prof Hull to need to sign off on the IRB submission.*
Martz 3.16.15	*Mtg Cancelled, Martz traveling*	
Kim 3.23.15	*Mtg to discuss subsidiary plans and PPM3*	**Will add the remaining subsidiary plans even if they do not apply to this project.** Smoothed out the latest version of the WBS and discussed the issues I am having with MS Project.
PPM4 696A		

COMMUNICATION LOG

Huber 3.25.15	*Meeting to review final survey questions and consent*	**Edited final survey docs to send to Winters for final review.** *She is concerned with the complexity of the consent page. It looks too involved and could keep people from responding. I agree but the UAA IRB process requires it.*
Piccard 4.3.15	*Meeting not held due to Crissy travel schedule*	
Hull 4.6.15	*Meeting to discuss MS Project*	**Will use Project as a learning tool to enhance knowledge of Project processes.** Since Schedule management is not an area I am using to demonstrate mastery, I am using it as an opportunity to continue learning.
Martz 4.6.15	*Quick meeting to update the status of the IRB*	**Received first modification request from IRB will respond accordingly.**
Mumaw 4.7.15	*Call to discuss modifications required for IRB*	**Made all required modifications, including those requested in #2.** Resubmitted and waiting for approval.
START PM686B		
LAWA 6.1.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 6.8.15 – 6.21.15**
Cal Tech 6.15.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 6.22.15 – 7.5.15** **UPDATE:** They could not find a way to send informed consent to employees without sending to students. PM decided to cancel this as a survey site, Realized Risk R4, implemented response plan according to PMP.
JPL 6.29.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 7.6.15 – 7.19.15** **UPDATE:** By day 2 it was clear that there would not be enough people participating to deliver statistically valid results. R4 response plan was already implemented and continued to determine new sites. Contacted JPL again to discontinue survey.
LinkedIn 7.13.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 7.20.15 – 8.2.15** **UPDATE:** Response set is low and is questionable if the mix will deliver statistically valid data. PS requested a fifth survey site to be sure.
Intuit 8.17.15	*Initial discussion to explain survey process and determine time to send Informed Consent to Employee Group.*	**Decided to perform survey 8.24.15 – 9.6.15**

COMMUNICATION LOG

Hull 8.3.15	*Call to question the addition of employers in response to the realized risk during survey execution.*	**Roger reiterated the allowable changes based on my survey scope.** No issues with the necessary change, advice given to proceed.
Goldstein 8.25.15	*Call to discuss the survey outcome ramifications of the Qualtrics anomaly as realized one Day 1 of the last survey.*	**Erick confirmed there are appropriate explanations for the specific issue that was experienced.** He gave me the necessary steps to report out the anomaly within the research paper while preserving a high level of confidence in the data. He also suggested removing the portion of the abstract that compares the data to health related needs. There will be enough to report just using the new data, and future reports can include this comparison, but would be too broad for this project's needs. PM agreed, edited PMP to reflect the change.
Dix 8.26.15	*Call to discuss survey outcome ramifications of Qualtrics anomaly.*	**Reinforced Dr. Goldstein's opinion that anomalies such as this occur often in surveys, and is not cause for concern of the validity of the data.** Dr. Dix stated that the anomaly deserved nothing more than a footnote in the final report.
Committee Interviews 9.9.15	*In person interviews of potential committee members to determine PM686B Communication Expectation.*	**Determined Committee members for Phase Three.** Kim, Hull, and Piccard will serve on Committee, and Kretchik will remain on as SME without having to commit to committee meetings.
Kretchik 9.10.15	*In person meeting to review initial survey results and determine final research tools and methodologies.*	**Determined based on complexity of data received to focus in on one area for the initial report that will be part of the final deliverable. Future analysis can be done for publication, but for this project many of the multiple comparison tests would be going overboard with content. Decided to output Descriptive Statistics and use that information to determine Confidence Intervals to determine if mode type affected stress level, and if so to what extent. This will be the basis of the final paper.**
PPM 1 686B		
Martz 9.14.15	*Weekly Phone Update*	**Discussed any potential impact to schedule due to Transportation Reauthorization being taken up.** There is no expected impact at this time, we can reevaluate if that changes. For now the more important issue is to analyze the data.

COMMUNICATION LOG

Vanpool Council 9.16.15	*Regularly scheduled meeting (conference call)*	**Updated group on project status.** No questions at this time.
Piccard 9.24.15	*Biweekly phone update.*	**Discussed PPM1.** Decided the knowledge area tools should be explained in further detail, with measurement explanations about how the outcomes will be measured.
PPM 2 686B		
Hull 9.28.15	*Discussion regarding baseline in MS Project*	**Explained the issue in my MS Project schedule.** Going to do a "go to" meeting next week to try and demonstrate how to fix the issue.
Martz 10.5.15	*Regularly scheduled meeting (conference call)*	**Discussed desire to pull back on number of meetings.** There are other pressing matter for his oversight, and at this point he is confident I am far enough along that I no longer need weekly updates. Moved to every other week, or as needed without the formal process.
Kretchik 10.1.15	*e-mail communication*	**Discussed initial outcomes of survey data.** Decided based on low response rate to ignore all data for weekend responses. This will keep the weekday data more reliable. This decision was made before viewing the analyzed data, and was based solely on the response rate of the individual days.
Deming 10.1.15	*e-mail communication*	**Updated on project progress.** Very excited about the amount of data that was collected. Great for future analysis, which Devon will be part of.
Gallagher 10.5.15	*Discussed data outcomes*	**Went over the analysis that was performed.** Did not go into specific tests, simply went over the way the data was aggregated using excel formulas.
Piccard 10.7.15	*Discussed inclusion of IRB in paper*	**Discussed if inclusion of critique of IRB process is appropriate.** Decided it can absolutely be included, but will depend on how much space needs to be filled. Decided to include if it enhances the paper.
Martz 10.19.15	*Regularly scheduled meeting (Conference call)*	**Discussed his upcoming travel schedule for reauthorization.** Decided my focus will be to continue working on thesis and regular work duties, and not have much commitment to any of the reauthorization commitments.
Piccard 10.23.15	*Regularly scheduled meeting*	**Cancelled** Will not reschedule and instead wait until next meeting time. The next few weeks involve the data

COMMUNICATION LOG

		analysis, and time is more appropriately spent working with Roger/Gary.
Kretchik 10.24,25.15	*Review my data analysis*	**Review of all CI tests.** 24: Review of CI tests performed, type of test used not necessarily giving the results appropriate to the hypothesis. Identified different CI tests and ran instead. 25: second set of CI tests (5 different) reveals correct data and accepts hypothesis.
Hull 10.27.15	*e-mail communication*	**Discussed requirements of final report.** Discussed if any disclosure of my employment is necessary within the paper. Since there is no conflict of interest (i.e. commentary on performance of company) there is no reason to disclose. Also discussed formulas used and tests run to update on overall project status.
Martz 11.2.15	*Regularly scheduled meeting*	**Review of company and travel priorities through end of project.** Determined a schedule to meet project requirements while meeting work deadlines.
PPM3 PM686B		
Piccard 11.4.15	*Rescheduled due to Luann's schedule*	**The meeting was held later in the week.** We discussed the final project document structure, and reminded to send satisfaction survey results.
Hull 11.13.15	*Updated during class time as was decided earlier that day*	**The editor was late in returning documents.** Decided to find a new editor, even though it would push back timeline. The professional edit was necessary.
Martz 11.16.15	*Discussed final high level findings*	**Decided on a time to go over next steps with LAWA and Devon.** The close of this project is the beginning of a new project, and a timeline for that needed to be discussed.
PPM4 PM686B		
Piccard 11.18.15	*Discussed final paper high level findings*	**Quick call to discuss Luann's edits.**
Hull 11.19.15	*Discussed final paper edits*	**Check in to determine when Roger's edits would be ready.**

Knowledge Area Selection

Knowledge Area Selection and Description of Application			
Agency/Organization Name	vRide Inc.	Version Number	8
Project Name	Vanpool Research Project	Revision Date	11.30.2015

NOTE: 686A notes are at the top. Scroll to where 686B begins to evaluate second semester progress.

Knowledge Area	Description of Application and Measurements
PM686A	
Stakeholder Management	The large number of stakeholders involved in the project, the survey, as well as interest in the final outcomes, requires management of their expectations to deliver a successful project. The expectations of the outcomes could potentially have a negative impact on the control of the scope. Keeping the needs and the interests of the large group will be managed through regular communication and designated meeting times to discuss progress. Notes from the individual meetings will be logged into the lessons learned file to ascertain stakeholder satisfaction over the course of the project. Stakeholder satisfaction will be measured by reports of their understanding of the project as it progresses and their overall feeling of being understood. This will be measured in individual interviews. It will be a goal of the project for the relationships of the external stakeholders to increase in satisfaction at the end of the project, through a satisfaction survey at the close of the project. The recorded levels of satisfaction as well as any individual comments will go into the lessons learned repository. Each meeting (with level one or 2 stakeholders) that is scheduled will be a project requirement so that fulfillment of these status updates is scheduled as work packages in the schedule. 686A PPM3 Update: Individual stakeholder expectations and measurements of success were added throughout the communication register, through the updated stakeholder register, and throughout the PMP. Measurements of project success as well as definitions of what will be considered “accepted” in the PMP will help guide the project to stay within scope and keep unimportant, non-relevant, or scope creep based stakeholder introduced changes out. Section added to Lessons Learned Rep. to track stakeholder needs that fall outside of project and current scope. Project is developed using SME interviews of the requirements of the industry, and updates on the current research topics going on currently or in the next 3 years. The schedule was developed in response to these needs and to deliver the requirements of the Capstone class schedule. 686A PPM4 Update: A Stakeholder satisfaction survey was developed and sent to all high level stakeholders. This will be used as a measurement tool throughout the rest of the project to gauge stakeholder acceptance at various points during the project. Individual stakeholders can be added or removed from the list observed depending on the current needs of the project. The results will be inserted into a radar chart to allow for a more visual representation of stakeholder satisfaction. The questions asked will also allow for a better understanding of their requirements. It will show their desired level of participation at various points in the project and I can tailor their desired level of participation to my targeted level of participation and make changes to try to align those properly.

Communication Management	A communication plan and schedule will be a major part of the project management portion of this project. The interconnected nature of the stakeholder expectations and a fully developed project management plan will assist in the control of the scope of the project. Communication will be listed in the intervals identified in the stakeholder register and communication plan and reviewed for execution and progress. Any changes to the scheduled meetings must be given alternatives in the change management plan, within the stakeholder expectation allocation. Individual meetings may be cancelled or rescheduled based on the needs of the individual. Complete removal of ongoing meetings based on the requirements listed in the matrix are not permitted unless it has gone through the change management process and there is a justifiable reason to the success of the project to make such a change. Milestone requirements must be met, or changed according to the change management guidelines. The majority of the survey related deliverables will need to be posted in advance of their required capstone deadlines due to the human studies research nature of the survey. This will alter the schedule of the program plans, and ongoing communication to the advisory committee will be important in keeping my advanced schedule on time for IRB review. The communication outcomes will be logged in the lessons learned file and measured in the schedule by completion of the scheduled events. 686A PPM3 Update: A communication log was added to the lessons learned repository. This will provide a historical account of the project progress and will provide the basis for measuring stakeholder satisfaction throughout the project. Eventually the communication log will be driven by the project schedule once all meetings are numbered and added to the schedule. This will provide a strong basis for understanding stakeholder needs throughout the project and will show the evolving nature of their satisfaction based on their input. The Stakeholder Register was updated to add a column for when specific changes are requested to track at what point in the project changes are requested as a way to provide insight in future research attempts. Could deliver valuable information about the kinds of changes requested, when, and can help from more accurate risk evaluations and scope conformance in future research attempts. 686A PPM4 Update: The stakeholder survey that was developed has specific questions regarding the satisfaction level of the communications going to and from the PM and the high level stakeholders. The various points of interviews that will be held throughout the project will allow for higher level execution of stakeholder requirements. The communication notes will continue to take place for the specified meetings. There will also be a stakeholder survey that will be housed in the lessons learned repository that will also log when changes were needed to increase satisfaction throughout the life of the project.
Scope Management	Due to the minimum level of vanpool related research presently available to the industry related stakeholder groups, scope creep is a recognized risk within the Project Management Plan. There will be many opportunities for stakeholders to attempt to introduce new approaches or requirements to suit their individual goals, which may be contrary to the project goals. Controlling the scope is the most important aspect of this project. In the event that risks are realized, the order of project importance are: Constrain Scope, Accept Schedule, and Enhance Cost. The time that is allotted on a weekly basis to work on this project in addition to other commitments non attributable to the project require strict adherence to the schedule. There are opportunities for making the timeline longer based on using the summer months between 686A and B to make up for any changes to the schedule due to IRB approval. However, the scope of the survey cannot change due to the limitations of the IRB approval as well as the ability to analyze the data observed by a small team. This makes scope management the most important aspect of the project. Changes to the scope must be approved by the project sponsor, who is also the only authority to commit more resources to the project. Scope management will be measured by adherence to the V.1 of the Charter and tracked through the change management process. All changes will be posted to the lessons learned file along with project sponsor approval for the scope change (if required). In lieu of project sponsor approval when required, no changes to the scope are allowed. Scope Management will be measured against the outcome of the commuter survey and the final scope statement as allowed by the project sponsor. 686A PPM3 Update: The change management plan was updated to include risk ID and strategies as well as a methodology for determining risk by scale and corresponding strategy. Change management was updated based on the risk definitions to provide guidance on how and when changes will be accepted. Accepted and logged first change in this PPM which was directed by immediate supervisor, and accepted based on the change and risk management parameters. 686A PPM4 Update: All remaining subsidiary plans were added to the PMP. Originally those plans were left out intentionally since they are not going to be included in this particular project. However, further review indicated inclusion of these plans and the individual explanations of why detailed plans are omitted is an additional scope control measure. Subsidiary plans were developed and included in the final version of the PMP. An additional change was denied and included in the lessons learned repository. One of the biggest scope creep issues (inclusion of carpool data) was successfully averted during the survey and IRB development process. This was one of the most likely sources for scope creep through the planning phase of the project. Given the IRB package has been submitted the level of risk for scope creep decreases significantly for the remainder of the project.

PM 686B Plans	These are the same knowledge areas that will be used during Phase Two (Survey administration) and Phase Three (PPM686B). The phases of the project do not change the importance of these factors on this particular project, and therefore will continue to be the focus during planning, and execution for monitoring and controlling the project. The main differences will be the change in players of the highest level stakeholders, and associated changes in the communication plans as a result. Controlling the scope will shift from managing the survey development to controlling the materials presented in the final paper deliverable.
Knowledge Area	**Description of Application and Measurements**
PM686B	
Stakeholder Management	The stakeholder group is still large and complex. There is still the opportunity for additional requests to increase the scope of the final deliverable. During this critical time it is more important than ever to control stakeholder expectations as a monitor of controlling scope. Therefore, the same knowledge areas have been chosen to preserve continuity of the communication plans set up during Phase One, and Phase Two. Phase Three will focus on executing the communication plan as a form of stakeholder management. Stakeholder satisfaction will be measured by two more surveys of the high level stakeholders using the same criteria they were questioned on during Phase One. This will create a timeline and recordable data to be reported out in the final project report. The surveys will occur After PPM 2 and just before PPM 4. The stakeholders have requested their specific time allocation they are willing to put toward their participation in this project, and therefore surveying them at each PPM would be unnecessarily burdensome. Outcomes will be part of the final presentation and defense. Notes from the individual meetings will continue to be logged in the Communication Log for future reference and to ensure meetings occur according to the schedule. The schedule will serve as an additional control tool for stakeholder management since all meetings will be scheduled there. Measurement Tool: A 6 point satisfaction measurement survey to be administered after PPM2 and before PPM4 for all high level stakeholders. Stakeholder satisfaction will be measured as success for an overall satisfaction level of 4 or more. Lower numbers are acceptable and will not be counted if the reasoning is the stakeholder's inability, not the project's delivery. For 686B High level stakeholders are : Hull, Piccard, Kim, Martz, Deming, and Kretchik
Communication Management	Ongoing dialogue with the key stakeholders is of highest importance. Through consistent and expected communication scope was easily controlled through the first two phases of the project. Communication expectations are laid out according to the Requirements Traceability Matrix and those requiring communication have been updated to reflect their active and or inactive status going into the final phase. The preferred methodologies requested to execute communications are listed in the Communication Register. New stakeholders have been added based on accepted project changes reflected within the PMP. The same measurement tool will be used in the final phase of the project as the first one. This ensures continuity across all phases and allows the project to be measured as a whole in terms of stakeholder satisfaction which is measured as a function of Communication Management. Additionally, as a measurement tool for Phase Two all survey site representatives (as listed in the Communication Plan) have received a list of items to rate their survey participation. These items will be used in the final project dialogue to provide suggestions for future research, and an expected outcome of this project is to provide information for future surveys. This is planned to provide a measurement tool for the stakeholder and communication knowledge areas as represented during Phase Two of the project which occurred between PM686 A and B, but are a critical portion of the overall project dialogue. Measurement Tool: A 6 point satisfaction measurement survey whose questions will relate to the 5 points of communication satisfaction with points in response time to ensure their expectations are met. Project Communication Management success is defined as an overall satisfaction level of at least 4 or more. Lower numbers are acceptable and will not be counted if the reasoning is the stakeholder's inability, not the project's delivery.

Scope Management	The scope of the project is the item that the PMP states must be controlled. As such, it is extremely important to monitor the scope in an ongoing manner to ensure that no new additions are brought in, and items in the project are removed if it is determined that it is unnecessary work. This is still extremely important going into Phase Three. Scope will be managed through the Change Management process as outlined in the PMP. Over the course of the first two phases the change management protocol provided exactly the right amount of control to allow for change when it was necessary and without broadening the scope. It also provided a repository for the changes that were not accepted so that they were individually logged and as a result the stakeholders responsible for requesting the change were satisfied that their concern was heard and could be incorporated into future studies. An additional area was added to the Lesson Learned Repository, and that was the "Unidentified Unknown Realized Risk" profile. This is a measurement tool to reflect changes that are outside of the scope due to the unknown nature of possible risks. This log states risks that were not contemplated during project planning (unknowns) but also must meet the change guidelines as defined in the change management plan. It also provides a template for potential future issues with this type of research so that unknowns can be minimized. The measurement tool for scope management is the overall project execution according to the final scope statement as approved by the PS. Accepted changes must be logged and any actions taken must be explained. Any unaccounted for changes would be considered a major flaw in the final project deliverable. To avoid this, and ensure that changes still meet the requirements of the scope the change management plan is the tool that will measure scope management. Measurement Tool: The change management plan as originally defined in V5 (final V prior to execution) of the PMP. All changes must be numbered, unlimited changes are permitted as long as they follow the requirements of the plan. Any change accepted that does not fall within the plan will result in scope measurement as unsuccessful. There are only two possible outcomes of measuring the scope, given that scope is the potion that required control. Either Successful (based on following the plan) or Unsuccessful (based on allowing any change that was not according to the plan). More than two accepted changes that are outside of the Change Control Process will initiate a review of the Change Control Process for appropriateness and efficacy.
Survey Measurement Questions to be used:	Communication Time Communication Quality Current Involvement Desired Involvement Response Time Overall Project Satisfaction (This question was added for 686B as final outcome measurement)

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KNOWLEDGE AREA ANALYSIS

Project Title: Vanpool Research Project **Date Prepared:** 11.30.2015

Application and Performance Progress

Stakeholder Management	Scope Management	Communication Management
PM686A		
PPM1: Baseline Selection of Knowledge Areas		
Notes from the individual meetings will be logged into the lessons learned file to ascertain stakeholder satisfaction over the course of the project. Stakeholder satisfaction will be measured by reports of their understanding of the project as it progresses and their overall feeling of being understood. It will be a goal of the project for the relationships of the external stakeholders to increase in satisfaction at the end of the project, though a measurement of that is yet to be identified. Each meeting that is scheduled will be a project requirement so that fulfillment of these status updates is scheduled as work packages in the schedule.	Controlling the scope is the most important aspect of this project. There are opportunities for making the timeline longer based on using the summer months between 686A and B to make up for any changes to the schedule due to IRB approval. However, the scope of the survey cannot change due to the limitations of the IRB approval as well as the ability to analyze the data observed by a small team. Scope management will be measured by adherence to the V.1 of the Charter and tracked through the change management process. All changes will be posted to the lessons learned file along with project sponsor approval for the scope change (if required) Scope Management will be measured against the outcome of the survey and the final scope statement as allowed by the project sponsor.	Communication will be listed in the intervals identified in the stakeholder register and communication plan and reviewed for execution and progress. Any changes to the scheduled meetings must be given alternatives in the change management plan, within the stakeholder expectation allocation. The communication outcomes will be logged in the lessons learned file and measured in the schedule by completion of the scheduled events.
PPM2 Updates GENERAL: Additional measurement tools added to all plans. Communication log created and linked to lessons		

learned repository. Will begin tracking updates of knowledge areas at each PPM interval to understand if there is an increase in satisfaction at any point in the research process based on information delivered. This will assist in future follow up research to build communication plans based on the lessons learned. Addition of this Knowledge Area Analysis to ensure requirements are met, and changes are updated specific to the selected knowledge areas a measurement tool. This process will help identify areas for improvement throughout project to deliver a more thorough result while incorporating new ideas and stretch goals as identified.		
Stakeholder document updated to broaden the information for each stakeholder. List of Stakeholder expectations updated to include current and expected outcomes. List of stakeholders expanded to include many more end user stakeholders, as well as others that the research may affect without their knowledge. Stakeholder satisfaction grid was added to include the amount of detail to provide, and which stakeholders will be included in the satisfaction scores at the end and throughout the project. Communication plan was updated to reflect these changes. Stakeholder satisfaction based on agreed upon expectations as judged upon the notes from the meetings as recorded in the lessons learned repository.	Scope further refined to reflect inclusion of demographic data in the survey (Level 1 stakeholder request, no change to budget, accepted by PS) Change management procedure put in place to control outside influence, and stakeholder classifications added to reflect those with the authority to change scope, under authority granted to PM. Scope will be measured against the most recent version of the Project Charter, as approved by the project sponsor.	Communication and Stakeholder management and intertwined. The Stakeholder management will be measured by the logs from the stakeholder interviews for all stakeholders with a level of influence necessary to measure satisfaction through the project. End user level of satisfaction will be considered, but not measured as it is outside of the scope to have any continuing monitoring of survey results over time. Communication management will be measured by the schedule, based on work packaged completed to ensure all stakeholder meetings and interviews are completed. Changes to the schedule are allowed, and encouraged to allow for changes to stakeholder schedules as long as the total number of meetings does still occur. Added under PPM2 is a log of the conversations held in order to have record of requests and actions completed as a result of the request. No action is an acceptable completion of an action only if the action requires a change to scope that affects cost, and only if it is not approved by the PS.
PPM3 Updates		
Stakeholder documents further updated to include all survey locations. Stakeholder satisfaction grid updated to refine stakeholder requirements, some items removed that are not pertinent to this project.	Scope further refined to accept third employer as accepted through change process. Strategic acceptance which does not affect budget and therefore is	Communication plans were updated to reflect the changes of C3. No changes in communication measurements were added in this PPM.

All versions updated to reflect new version of schedule with dependencies added. A column was added to the Stakeholder Register to activate or deactivate stakeholders during the various stages of the project. All deactivated stakeholders require no further communication.	accepted under the controlled scope process.	
PPM4		
Sent all high level stakeholders a survey to gauge current level of satisfaction. This new process will be implemented no less than three more times during the project. The survey questions are designed to be short yet concisely appropriate to leveling the needs of the project against the needs of the stakeholders.	Scope controlled through the IRB submission. Early on "inclusion of carpool data" was recognized as a potential area for scope creep. The final survey and the measurement tools were submitted through the IRB process taking the project schedule past the time that that risk may have been realized. Successful control of the scope through IRB submission is complete. Next task in the schedule with associated risk for scope creep is during survey start and implementation beginning June 1.	Communication expectations were set early on through the individual initial interviews. The recent surveys that were sent to all high level stakeholders included updated information feedback in regard to communication expectations. This measured how the communication has been so far in the project. It also gave input on the expectations of communication going forward for the most important stakeholders for this point in the project. For phase two of the project a few more high level stakeholders will be added so new baseline communication needs will be required. The requirements traceability matrix reflects initial assessments of all stakeholders. A new survey will help identify if the high level stakeholders are satisfied during the next phase.
Stakeholder Management	**Scope Management**	**Communication Management**
PM686B		
PPM1		
Appropriate Stakeholder Management tools were identified and executed during Phase Two. As such, each stakeholder active during that phase (employer sites) was sent a survey to ascertain their thoughts of the survey experience for their site and employees. This measurement will be included in the final project	The scope was controlled through Phase Two through the change control process as planned in the PMP. There were additional unaccounted for risks that were realized, but the change management plan created a standard	Communication was managed through the initial expectations conversations held with the employer site contacts. At the close of the survey period a survey was sent to them requesting scoring on their view of the process to gauge their overall satisfaction with their participation in the survey but to also provide them with

report. For Phase Three high level stakeholders will be sent a survey requesting scoring on the same items requested during Phase One. This will provide the basis for the ongoing measurement tool consistent through the project. All stakeholders were contacted to ensure their expected levels of communication did not change between 686 A and B. Any changes are reflected in the Communication Management Plan, which is the document through which the work the achieve Stakeholder Satisfaction is Planned.	pathway so that as the [U]nidentified [R]isks were catalogued there was an appropriate response plan in place to easily accept or reject any potential change to the project and keep the scope clearly defined. These changes were numbered and listed in the Lessons Learned Log, and any realized risks were registered in the PMP with the appropriate response measure listed against the actual actions. These were the tools that effectively controlled the scope through Phase Two, and will continue to deliver high levels of satisfaction and project to scope requirements through the close of the project.	an opportunity to provide feedback that can be used in the development of future surveys. The schedule suspended updates for most stakeholders listed in 686A during Phase Two while the surveys were being performed, and because no progress updates were required to anyone during the execution phases of each individual survey except to the individual sites. Additional stakeholders were added and their individual communication requirements and expectations were added to the schedule. None of the new stakeholders requested anything that would have increased the scope and therefore their preferred communication structures were incorporated into the third phase of the project. Any stakeholders that are no longer active in Phase Three for ongoing communication needs were “deactivated” on the Communication Register.
PPM2		
Stakeholder Management measurement tool was further refined in the plan to accurately define what exactly would be measured, and at what dates, using what specific tool. The PPM1 review comments from the committee stated that the overall concepts were explained well, but that the actual tool was not clear. The selection document has been updated to include this information.	Scope Management measurement tool was further refined to explain the actual tool that will be used to measure project and product success. A follow up plan of action was also established to trigger review if the established response plans are not executed, or improperly bypassed.	Communication Management measurement tool was further refined in the plan to accurately define what exactly would be measured, and at what dates, using what specific tool. The PPM1 review comments from the committee stated that the overall concepts were explained well, but that the actual tool was not clear. The selection document has been updated to include this information. The precise questions that will be answered were added for the committee to understand the progress and anticipated surveys.
PPM3		
The first satisfaction survey was sent to all (5) high level stakeholders. To date only 2 have been received. Final outcomes will be listed in the lessons learned folder. This initial tool will measure where we are today and determine if any change in course is required before the end of the project.	Scope tool: no changes outside of planned documentation occurred to date. No review required. A final review of the milestones, Gantt, and abstract revealed no significant change to require any review at this point. Scope controlled through PPM3.	First satisfaction survey was sent to all (5) high level stakeholders. The questions specifically asked about level of communication and desired level of communication. To date all responses match current correspondence with desired level. The planned communication plans are effective and meet the quality expectation of the stakeholder group. Final outcomes will be listed in lessons learned folder.

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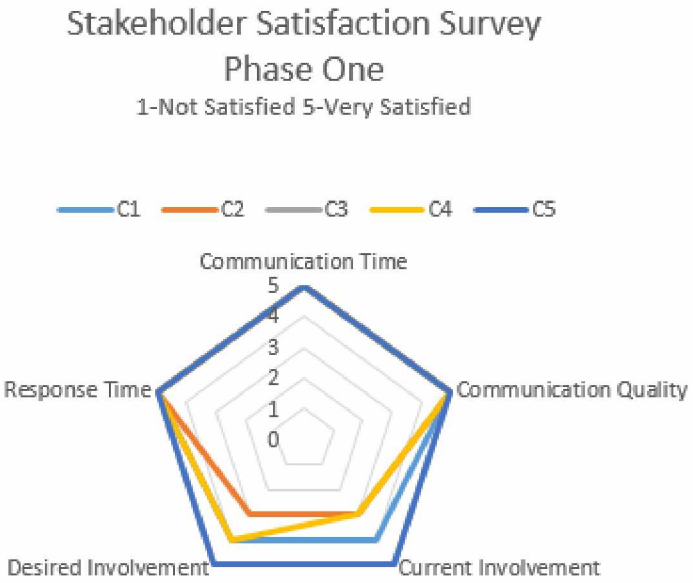
KNOWLEDGE AREA ANALYSIS

Survey 1 686B Outcomes: Outcomes will be used as measurement tool in final project outcomes, and are used now as a measurement tool against progress. 6 questions asked: [scale 1-5] **1** Communication Time: Communication is sent according to our established schedule **2** Communication Quality: Communication reflects what I want to know about the project **3** Current Involvement: My current level of involvement in this project **4** Desired Involvement: My level of involvement I want to have in this project **5** Response Time: I receive timely responses to my questions **6** Overall Project Satisfaction: My level of satisfaction in the project to date		Findings as of 11/4/15 Hull: 5,5,4,4,5,5 Piccard: Kim: 5,5,4,4,5,5 Martz: 5,5,4,4,5,5 Deming: Kretchik:
Survey 2 686B Outcomes:		

KNOWLEDGE AREA ANALYSIS



KNOWLEDGE AREA ANALYSIS

***Notes from individual Knowledge Area Performance of what went well and what should be improved are logged accordingly in the Lessons Learned Repository, but should be considered part of the Knowledge Area Analysis. It would be considered rework to include the same information in two areas and therefore is only included in the lessons learned file.

Knowledge Area	Final Outcome
*See Lessons Learned	*See Lessons Learned

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LESSONS LEARNED

Project Title: Vanpool Research Project **Date Prepared:** Jan.26.2015 **Last Update: 11.30.15**

Project Performance Analysis

	What Worked Well	What Can Be Improved
Requirements definition and management	Initial interviews with high level stakeholders helped create the survey questions since preferred outcomes were identified early on. Giving those same stakeholders access to the survey after development gave them the ability to see up front if their expectations would be met based on the questions asked, and tweaks to meet their expectations could occur before execution.	*Requirements Management into Phase Two was difficult from survey to survey when stakeholders wanted their individual results right after the survey period. Though they knew the survey was being developed for use in a paper to be published later they did not fully understand they would not receive individual results until after the paper is published. In the future make sure those participating know when to expect to receive a copy of the information if they request to receive it.*
Scope definition and management	The time spent (almost a year) fully developing the scope before beginning the charter process helped keep the scope controlled in the beginning phase of the project. While many students lost valuable time with scope revisions, this was not an issue for this project. Taking the Research Definitions Class was helpful in practicing different research models which allowed the scope to be further refined at v1 than the majority of other projects during same period.	*During Execution though the scope was executed according to plan, the identified companies did not have enough of a statistically valid mix of vanpoolers and SOV's. [R3] This meant more companies had to be identified to meet the minimum scope requirements. Since the final product would not have been of acceptable quality a decision has to be made to identify more companies which delayed survey analysis. In the future if a mix of responses is required, a baseline to establish what should qualify in advance would reduce rework.*
Schedule development and control	There was ample time built into the execution phase of the schedule to handle all of the unknown risks that presented during execution.	*http://teamup.com/kscb9d08d785ef0523/ (first version of schedule) did not have a tool for schedule management initially. This made planning more difficult than it needed to be. PM did not have a proper schedule until late into Phase One, and rework time was wasted due to not having an appropriate tool. Recommendation: have all tools in place before initiating project to avoid rework.*
Cost estimating and control	Even as more employers became involved the total number of survey awards remained the same.	*Project buffer could have been included for unknown scenarios. PM knew unidentified risks during survey execution was likely, but did not include a reserve budget for this purpose. Even a 10% reserve would*

		have encouraged more participation by increasing the total number of awards available.
Quality planning and control	Quality was defined in the scope as "statistically viable results from the surveys of three employers". 3 Employers were surveyed.	*The quality of the eventual outcome was defined, yet the quality of the percentage of the individual surveys was not. This became a realized known risk when one of the sites did not have enough of a mix between SOV and vanpool surveys. [Note: R4 was realized, but is slightly different in definition than this. It is not that there was enough participation to make the data statistically viable, this was instead not a good enough mix of vanpool vs SOV surveyers.] This lack of detail during the survey prospecting phase eventually meant rework that was unplanned in the schedule.*
Human resource availability, team development, and performance	All SME's identified early on and given a communication plan followed their schedules and gave the project a lot of attention.	*In a one person project any health related complications can lead to schedule changes that cannot be recovered. The PM experienced a delay due to such a complication and though the delay did not derail the Phase One of the project it could have. Future scheduling of projects should have contingencies that were not available to this particular project.*
Communication management	PM decided to make Stakeholder Management a function of Communication Management. This created a series of meetings in advance of critical paths in the schedule to observe opportunities for enhancing the project outcomes while controlling scope. Since stakeholders felt they were part of the process their measured satisfaction ratings throughout the project were high. The change control process identified in advance assisted with communication. It provided a reference for what can/should be accepted and what could simply go into the lessons learned log for future studies. This kept communication open while also keeping scope within the pre-determined limits.	*If a set meeting time cannot be met due to either party's schedule, a follow up meeting may not be necessary. PM found several times where the stakeholder chose to not attend the meeting because they felt they had everything they needed. In the interest of everyone's time part of the communication plan in advance should state if meetings are missed if/when follow up appointments should be scheduled.*
Stakeholder management	A large wide net was cast several times over and stakeholder interviews revealed other important stakeholders that should also be added. The extra time spent at the beginning of the project to do this helped have the right people at the table during execution. As risks were realized these stakeholders were already	*If a stakeholder is particularly engaged discussing project items that are not in their area of responsibility could have delivered insightful tips.* *If a stakeholder says to contact them regardless of the topic it could be a good opportunity to enhance the*

	familiar with the project and could give helpful assistance without impacting too much of their schedule. Allowing them time to define their expectations and then communicating according to that schedule allowed for them to feel included. This made the stakeholder surveys reveal high levels of satisfaction as it was measured throughout the project.	*project during execution. The change control process can keep scope creep to a minimum if this process gives too much license from outside contributors. However, I believe there were missed opportunities to discuss potential outcomes with different stakeholders not typically associated with that topic, and could have been a unique learning opportunity. This became especially clear during the third phase of the project.*
Reporting	The reports used were concise and easy to compile and track which assisted in the clear communication among stakeholders. They provided standardized formats that allowed for quick status reporting and version numbering made following the progress of the project accurate.	*Only provide stakeholders that request written updates with those kinds of updates. Once written it was easy to simply forward information on to the group. Though they were satisfied with their level of communication, two stakeholders said they did not read the written reports and just waited for oral reports. It did not affect this project, but this could create stakeholder dissatisfaction in other types of projects.*
Risk management	The risk response plan met the needs of the identified risks if/when they occurred.	*There were a few risks that none of the stakeholders identified and were not accounted for in the plan. Adding funds to the Project Reserve could have assisted mitigating unidentified risks as they were realized. When it is known in advance that unknowns are definitely a possibility having any project reserve would at least give an option for how to address the appropriate response. Not all unidentified risks would have benefited from a financial response measure, but it would have been better than not having any option. (catalogued in lessons learned)*
Procurement planning and management	**N/A**	**N/A**
Process improvement information	Extensive pre planning during the initiation phase of the project was the greatest assistance to a smooth running project at every phase.	*There were a few times when information from outside sources was needed. A few of those times specific timelines for response was not given, and as a result the information was given later than needed. Future requests for information should always require a "Due by" date.*
Product-specific information	Test surveys and questions during the research definitions class gave me valuable resources and experience before actually developing the survey specific to this project.	*Even with 20+ professionals inside and outside the industry testing the survey before it was released to the public there was still an anomaly that was not identified until the fourth survey series began. Future surveys should be exported to a writing advisor and edited as if it was formal content. That step could provide an*

		additional layer of potential oversight before it reaches participants. *The survey was tested a number of times, however the outcomes of the test subjects were not analyzed. If this step had taken place it would have been known that the numbering mechanisms in Qualtrics were confusing and could have been changed before the surveys were sent. When planning on administering a survey, to the tests all the way through to the end so that the structure can be maximized not just to take into account participant experience, but also outcome analysis. It simply made the analysis tedious to try and compare the numbered responses since the numbers were not placed in actual numerical order by Qualtrics.* *The weekend data ended up being left out of the analyzed data due to the low response set. A determination in future studies should be made in advance if the respondents work weekends, and if not, that information should be left off the surveys. The additional expectation of responding on the weekend may have limited the number of participants.*
Other		
Data Analysis	*Performed several different kinds of CI tests in order to ensure validity of data.*	*Did not perform a test to see if data was normally distributed before running tests. Doing this before running the CI tests would have narrowed down the field of potential tests to run against the data. The overall outcomes did not change as a result, and the team may have chosen to run the other tests anyway. However, running the test to determine if the data was normally distributed or not would have been more appropriate than going straight to the CI tests from a statistical analysis perspective.*

vRide

LESSONS LEARNED

Realized Risks and Issues

ID	Risk or Issue Description	Response	Comments
R4	*Low Survey Response Set*	*Identification of new potential survey sites for follow up surveys as planned in the PMP.*	*Risk 4 was realized during the second scheduled survey.*

Risks not identified in PMP [UNKNOWN REALIZED RISKS]

ID	Risk or Issue Description	Response	Comments
U1	*Unbalanced mix of control population*	*Follow up surveys administered to maximize potential for statistically valid information.*	*A different version of this risk was identified in the early planning documents. That other risk was also realized, but this one needed to be mentioned separately because they are two separate issues,* ***and this one was not accounted for in the initial risk assessment****.*
U2	*UAA IT issues*	*Worked directly with Qualtrics to address the lack of e-mail access that was a result of UAA upgrading servers over the summer.*	*This resulted in a slight delay, but ongoing communication with the participants allowed them to track their information separately until the surveys could get through to them again.* ***They commented that they appreciated the ongoing communication through resolution****.*
U3	*Qualtrics anomaly in rating scale*	*The survey asked respondents to rate their self-perceived stress level of a scale of 1-10. The visual slide bar actually listed the #6 twice 1-2-3-4-5-6-6-7-8-9-10 As you slide your bar across you see a digital display of exactly the number you chose. Therefore, the research team has a high level of confidence that the information collected is accurate. There are brain functions that explain how this could happen and not be*	*Professional PhD level survey administrators were consulted following the discovery of this anomaly. They were satisfied the explanation of what was discovered would be enough, and that the information itself is still correct. Even still, a special analysis was performed to include additional material that addressed this particular number within the analyzed data, and reported out in the final report.* ***Discussions with Qualtrics revealed they did***

		noticed by so many people, which is explained in detail within the paper.	***not have an answer for what could have happened, or why it would have done that.***
U4	*Editor Late*	*The first editor was not making any progress on the final revisions, and therefore it was necessary to identify a new one, and require a quick turnaround. This set back the original schedule by a week and left the committee members with little time to review.*	***The initial PMP did not determine the editor not sending the paper back in time as a risk, and it should have been. Any part of the project not directly in your control should carry some level of risk, and then a backup plan would have been identified in advance instead of at the last minute. This delay resulted in dissatisfaction among the committee members near the end of the project unnecessarily.***

Stakeholder Requirements outside of Scope

Log for new stakeholder suggestions that are not part of current scope, but could be part of future research

Stakeholder	Description	Comments
L Huber	*Wanted to have carpool respondents participate*	*While not part of the scope of this project, future inclusion could reveal additional data of interest.*

Stakeholder Management

Stakeholder	Issue	Resolution	Comments
D Deming	*Updates from Survey 2 prompted her to request looking for additional participant sites so that the outcome would be of the quality described in the PMP.*	*PM agreed with this request, and team agreed it fit the intent of the scope.*	*Additional survey sites were identified to meet the original intent instead of simply narrowing the scope back to analyzing only LAWA as a site specific research study.*
E. Goldstein	*After discussing the number of total surveys he requested to narrow the problem statement as well as the Abstract to take out reference to comparing information to medical*	*Edited both of the documents to reflect this change.*	*Agreed completely with this analysis. As surveys started coming in and as the draft of the paper was being developed it started to seem like too much for the needs of this particular paper.*

	affects. The length of this paper if too small given the amount of data received to cover that additional aspect well. Narrrowing the scope of the narrative first within the original scope while making the paper more robust in reporting out the direct results of these surveys.		*Narrowing these items does not affect the scope nor the quality as defined in the PMP, and therefore was likely not really necessary to begin with. It was a good indication that the scope statement did not need to be changed at all when these items were removed that it did not belong in this project, and is likely instead a suggestion for future analysis of the data, not for this report.*
J Gallagher	*Spot checks of the data that was inserted into formulas in excel were not matching up for only one of the data sets.*	*PM went back to the original Qualtrics responses and downloaded again and uploaded the master file to a new excel sheet. Jack joined a remote session and filled in the remaining formulas. Review by hand showed the new data file to be correct and free from flaws.*	*The data sets are ready for the statistical analysis now that the initial review has been completed. Performing the spot checks in advance saved unnecessary rework of the statistical analysis which could have been a much bigger issue than simply correcting the excel set.*

Other

Areas of Exceptional Performance	Areas for Improvement
The selected knowledge areas represent the best portions of the project planning and execution. They were appropriate to the project, and the additional focus created paths to enhance the overall project due to the ongoing analysis of those portions. Stakeholder satisfaction was high, communication plans were executed according to the requirements, and scope was controlled through these channels. The overall quality of the survey was a result of ensuring that requirements were met, and the ongoing conversations with the stakeholder group made determining the direction of the paper easy. For future projects, it is advisable to include specific areas to focus on so that the project is enhanced appropriate to the scope.	Utilize the scheduling tool more effectively. Having limited previous use of MS Project limited the ability to use the project tool to maximize its capability. This resulted in more project time than should have been spent on scheduling. This is an area that was identified in advance as a weakness of the PM, and so this project was used as a specific learning opportunity. If the PM decides to go into scheduling more training will be required. In the meantime even a slight increase in the scheduling tool MS Project would help keep the extra work hours to a minimum.
Responding to changes according to the risk schedule created a culture of calm during the execution phase.	**An analysis of the output of the test surveys would have identified areas for improvement before the active surveys were sent out. This was an oversight, and it added to the time it took to analyze the data. Practice analyses should be performed for future surveys until the survey tool is completely understood.**

Keeping an ongoing log of changes and unidentified risks throughout execution made it easier to get through 686B without incident.	

Individual Survey Site After Action Dialogue

Survey 1: Los Angeles World Airport:

The employer confirmed the SOV to Vanpool ratio in the response set (sample) to be consistent with their Population size. On Day 3 of the survey all surveys stopped being received which prompted the participants to alert me to the issue. After a day of determining it was not a firewall issue at the employer, further research conducted through Qualtrics revealed that the surveys were being administered through Qualtrics but not sent through the UAA server. The UAA IT Dept. confirmed that they were upgrading servers that would take approximately two weeks during which time no surveys could be sent. Given the timed nature of the survey Qualtrics permitted me to have a private account outside of UAA so that the survey would not be interrupted. This required copying all surveys into a new account which took some time. In all the surveys were sent the next day and participants were instructed to fill them out individually using the information they made notes for the previous day. This kept the data as fresh as possible while the workaround could be fixed. The remainder of the survey went well with a high level of interaction on a daily basis with their employees.

Survey 2: Cal Tech University:

The week before the survey begins the informed consent is sent to participants to give them time to decide if they can/should participate, and ask any questions of the research team. The link was sent to the employer contact, and when they tried to send it there was not a way to send the link to employees without also sending to students. The IRB submission specifically stated that students would not be part of this study, and in order to remain ethically aligned with the intent of the prospective data the PM decided not to administer at this site.

Survey 3 JPL:

During the week of informed consent only 15 people signed up to participate. Once the surveys began the daily results showed that the mix of SOV vs Vanpools to be only 2 Vanpoolers. Neither of those numbers were representative of the population, and not a good sample for analysis. On day 3 of the survey the PM sent a notice to all participants that the survey would stop due to the lack of participation but thanked them for their interest. The project team decided it would be better to stop the survey than subject those involved to 2 weeks of unnecessary work especially since the results would be be viable. The employer was grateful for this decision and wanted to be considered for future surveys. At this time they also informed the PM that they recently finished a commute survey of their own and that likely contributed to the lack of participation.

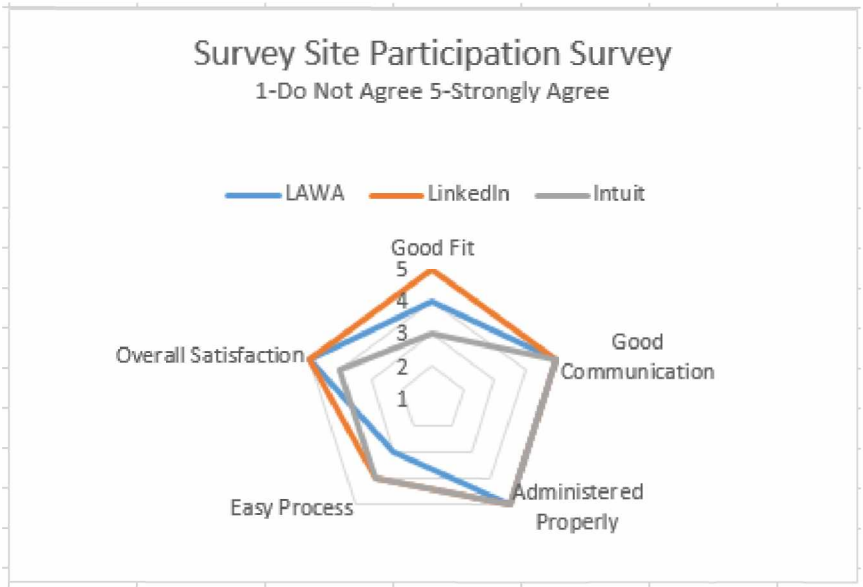
Survey 4 LinkedIn:

During the Informed Consent period it was looking like this site would also have a small sample size. After the first two days of the survey the PM contacted the site to determine validity of the sample size. Overall site specific information could not be shared (total number of employees, etc.) but when given the sample size the contact said “that sample is consistent with our SOV to vanpooler ratio, and is consistent with sample sizes we use when surveying our own employees”. They went on to say that was the same number of participants they would use to make business decisions on their own, and they believed it to be a good representation of the population. They requested the survey continue through the end. The PM monitored the responses daily and was still unsure of the data set delivering statistically valid data. A conference call with the highest level stakeholders determined that a fifth survey was needed in order to ensure quality of the final outcomes. It was decided that until the sample reflected more confidence among the

group one if not two more surveys would need to be administered. [Note: Formal analysis of the data has not begun, this decision is to attempt to maximize potential for at least two sets of data that will deliver statistically valid data.]

Survey 5 Intuit:

The question of "I am a Vanpooler or SOV" was moved to the Informed Consent document so that those that elected to participate, would be taken to the next question that was already part of the survey. By moving this question to the informed consent the research team could identify the mix of vanpool to SOV commuters before the survey even began. This way if the mix was not representative of the population it could be stopped before any surveys were sent to employees. A discussion with the employer confirmed the mix of SOV vs. Vanpool mix as representative of their Employee Count at the selected site (the invitation was sent to employees at a specific site so that the travel data would be comparable to the other surveys). As the survey was administered active participation among those participating made the research team confident that this would be the last survey that needed to be administered.

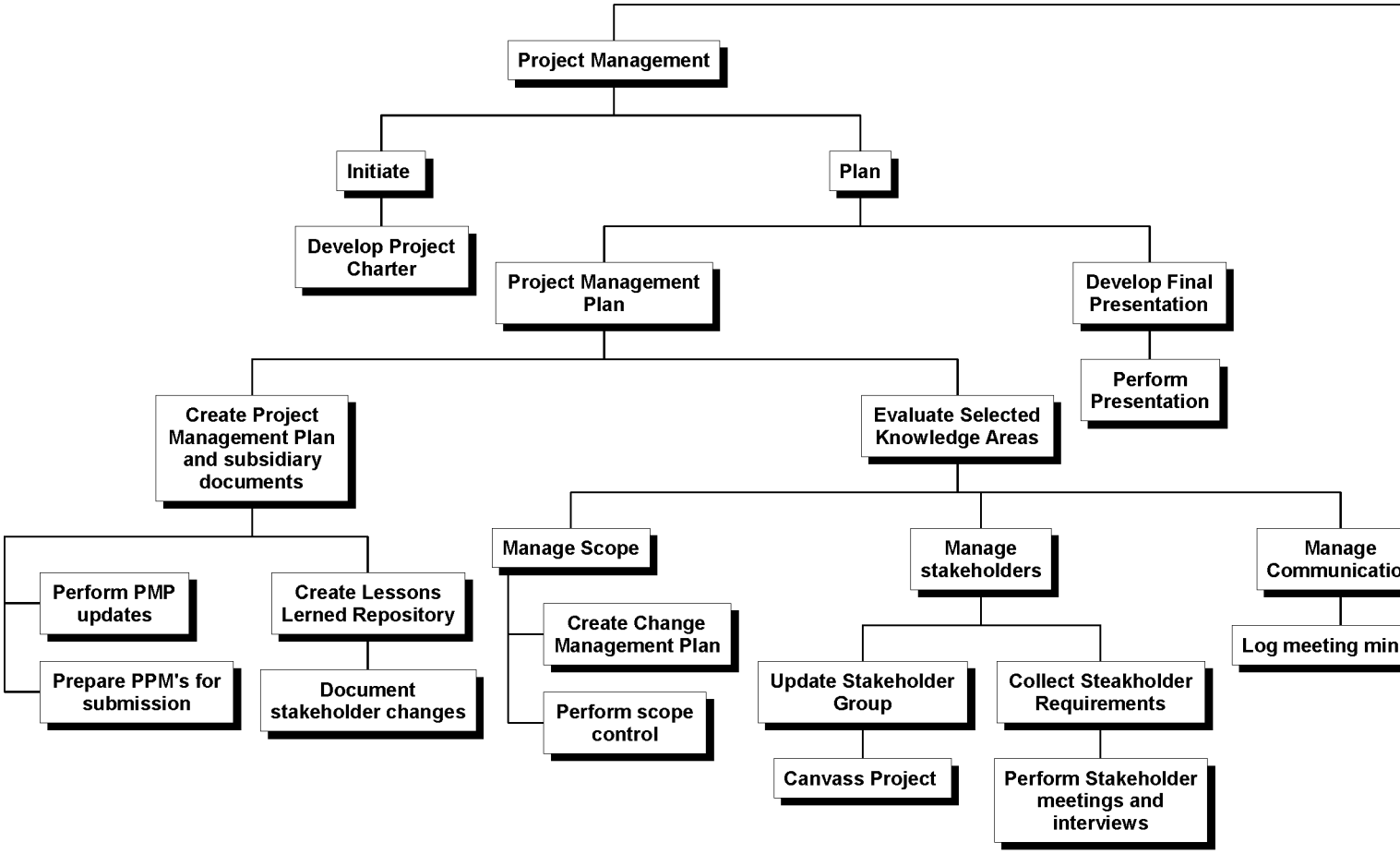


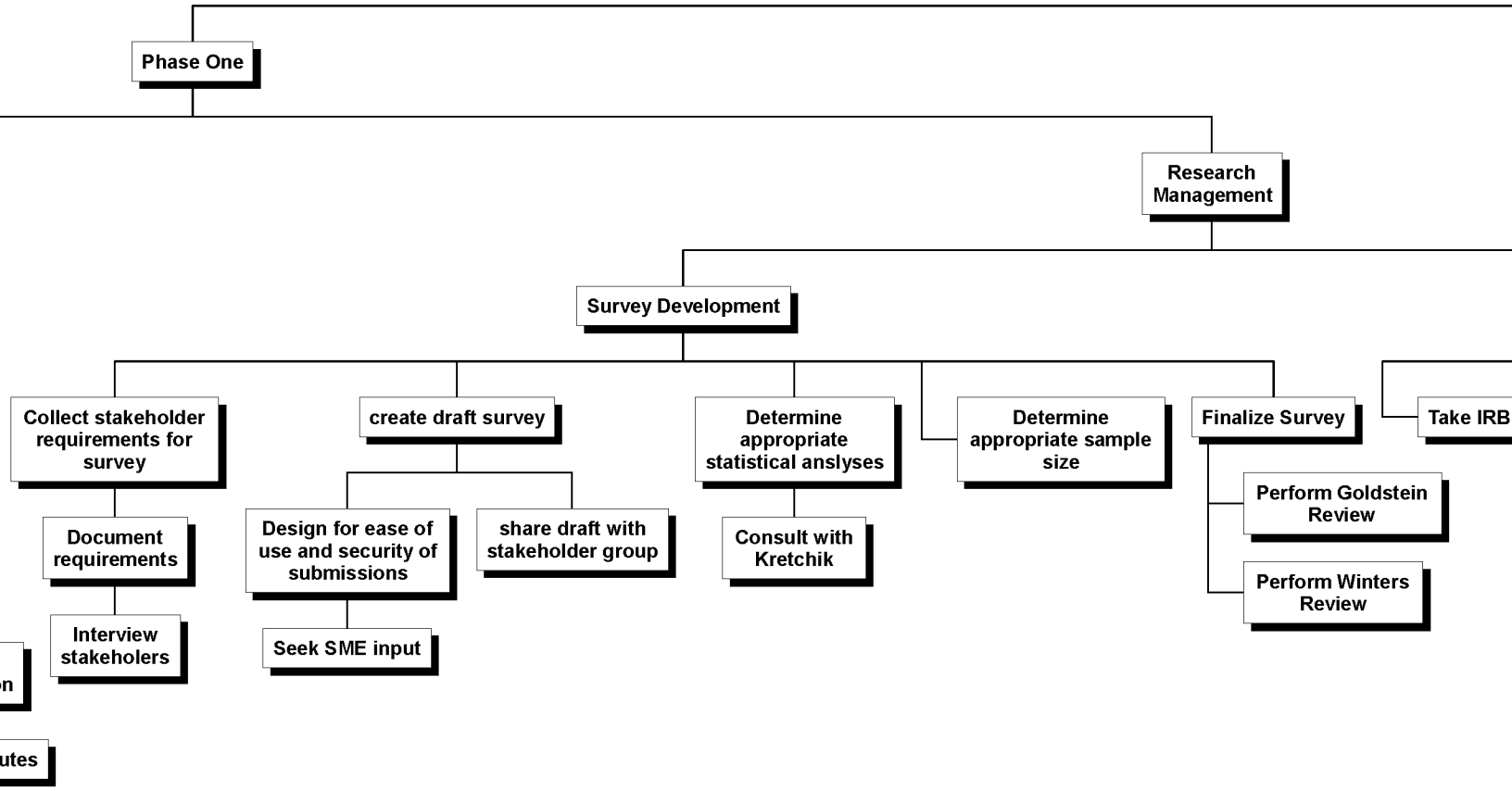
Survey to gather satisfaction level of site administrators

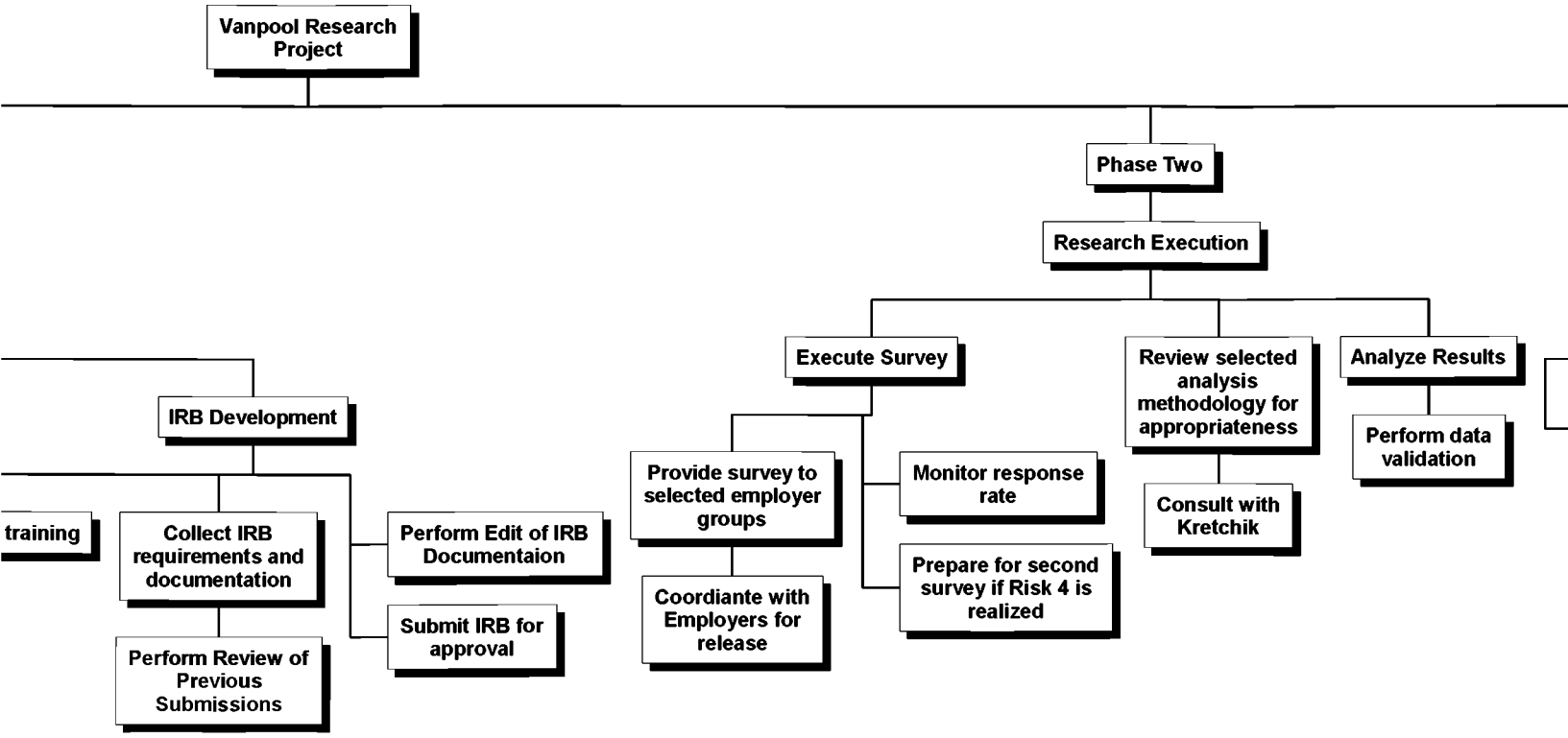
The site administrators all noted confusion among their employees due to the Informed Consent document. Future research should consider how this initial document might affect the overall survey experience. Additional responses from each site:

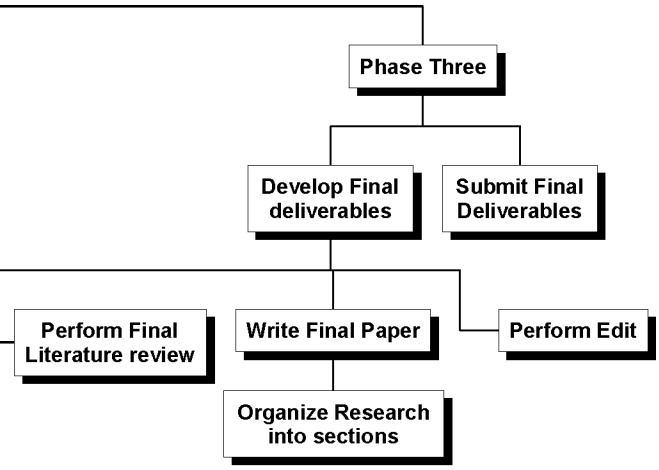
LAWA:	Process was difficult. Informed Consent was confusing, lots of calls from employees
Intuit:	Survey info in informed consent was very confusing. A lot of unnecessary language
LinkedIn	The informed consent process was annoying and unnecessary.

LESSONS LEARNED


Project Management
Initiate
Develop Project Charter
Plan
Project Management Plan
Develop Final Presentation
Perform Presentation
Create Project Management Plan and subsidiary documents
Evaluate Selected Knowledge Areas
Perform PMP updates
Prepare PPM's for submission
Create Lessons Lerned Repository
Document stakeholder changes
Manage Scope
Create Change Management Plan
Perform scope control
Manage stakeholders
Update Stakeholder Group
Canvass Project
Collect Steakholder Requirements
Perform Stakeholder meetings and interviews
Manage Communicatio
Log meeting min


Phase One
Research Management
Survey Development
Collect stakeholder requirements for survey
Document requirements
Interview stakeholers
create draft survey
Design for ease of use and security of submissions
Seek SME input
share draft with stakeholder group
Determine appropriate statistical anslyses
Consult with Kretchik
Determine appropriate sample size
Finalize Survey
Perform Goldstein Review
Perform Winters Review
Take IRB


Vanpool Research Project
Phase Two
Research Execution
Execute Survey
Review selected analysis methodology for appropriateness
Analyze Results
IRB Development
training
Collect IRB requirements and documentation
Perform Review of Previous Submissions
Perform Edit of IRB Documentaion
Submit IRB for approval
Provide survey to selected employer groups
Coordiante with Employers for release
Monitor response rate
Prepare for second survey if Risk 4 is realized
Consult with Kretchik
Perform data validation


Phase Three
Develop Final deliverables
Submit Final Deliverables
Perform Final Literature review
Write Final Paper
Perform Edit
Organize Research into sections

PM 686B Project Status Report Dashboard

Name: Crissy Ditmore Date: 9.4.2015

Project Title: Vanpool Research Project

Synopsis of Project	Progress Since Last Report
A project to develop, administer, and analyze survey results from the self-reported stress levels of single occupant drivers and vanpool participants before and after their commute. The purpose of this study is to accept or reject the hypothesis that commuters who use vanpooling as their commute transportation mode have less stress than their single occupant driver counterparts.	Four (4) Surveys have been implemented at the various sites. The final Survey completes on Sunday. Ongoing Literature review as new research has been recently published that may be pertinent. Evaluating the findings now. Identified an anomaly within the surveys due to a Qualtrics error. Discussed this error with Key Advisors, a workaround has been identified. Amended PMP to include new survey site selections **and log all lessons learned from survey implementation.**
Current Status	**Forecast**
A variety of changes at employer sites lead to a need to identify different participants. Low response rate (unbalanced) dictated the need to perform more surveys than initially intended. Scope remains unchanged while the names of companies identified are different. All of the data files for previous surveys have been aggregated and the final analysis of the data will occur over the next two (2) weeks **The Project Schedule has been changed to reflect these slips in schedule though so far no milestones have been missed.** **GREEN**	**Data to be analyzed and aggregated over the next two (2) weeks**. Informal outline was done over the summer to assist in formulating thoughts around potential outcomes. This should be helpful once the final results are found. Will interview committee members to determine appropriate KPI's for Knowledge Areas beyond my initial thoughts.
Anticipated Changes/Key Risks/Corrective Actions	**Key Takeaways/Where Help Needed**
The House is expected to take up their version of the Transportation Bill next week. **This is worst case scenario for my Project Schedule.** Have a	Qualtrics is not infallible and does not have means to help even if the issue is their fault. Future students seeking to do research should understand the risk they are taking.

team meeting scheduled in two (2) weeks where potential schedule conflicts may be addressed.	Making sure you have SME's outside the department for summer assistance is crucial if activities continue through even after classes stop. **Will be in town next week to interview potential committee members for 686B.**

PM 686B Project Status Report Dashboard

Name: Crissy Ditmore Date: 9.25.2015

Project Title: Vanpool Research Project

Synopsis of Project	Progress Since Last Report
A project to develop, administer, and analyze survey results from the self-reported stress levels of single occupant drivers and vanpool participants before and after their commute. The purpose of this study is to accept or reject the hypothesis that commuters who use vanpooling as their commute transportation mode have less stress than their single occupant driver counterparts.	Ten (10) pages of final report have been written. Final analysis of the individual surveys was completed. PPM 1 submitted. Updated the remaining PMP documents as well according to project plan ahead of scheduled PPM.
Current Status	**Forecast**
A research assistant was brought on to write the formulas necessary to deliver the final outcomes. Schedule in MS Project is not correct, will require assistance from Roger to correct (baseline not delivering progress correctly). **Final deliverables are ahead of class schedule, but according to Project Schedule.** **GREEN**	**Data to be analyzed for the salient points of the remainder of the paper to be written**. Schedule will be corrected before PPM2 with Committee assistance. Continue to stay on schedule per PMP, no delays are expected based on risk evaluations.
Anticipated Changes/Key Risks/Corrective Actions	**Key Takeaways/Where Help Needed**
Meetings with the Project Sponsor last week confirmed allocating alternate resources to assist with workload if Congress continues action on the Transportation Bill. Guaranteed that I would be able to complete this work this semester.	Project documents are in great shape, and continue to develop ahead of PPM schedule. Paper is progressing nicely. **Roger will assist with the MS Project problems identified last week.**

PM 686B Project Status Report Dashboard

Name: Crissy Ditmore Date: 10.8.2015

Project Title: Vanpool Research Project

Synopsis of Project	Progress Since Last Report
A project to develop, administer, and analyze survey results from the self-reported stress levels of single occupant drivers and vanpool participants before and after their commute. The purpose of this study is to accept or reject the hypothesis that commuters who use vanpooling as their commute transportation mode have less stress than their single occupant driver counterparts.	**Fourteen (14) pages of final report have been written**. Inline citations were added and the references section formatted to reflect the citations used. The TOC was created in automatic update form. Data analysis performed on the data sets, and inserted into formulas within Excel. PPM 2 submitted. Updated the remaining PMP documents as well according to project plan ahead of scheduled PPM.
Current Status	**Forecast**
Researcher finalized all formulas and we performed spot checks that revealed inaccurate data in one of the sets. Went back to original Qualtrics data and downloaded and uploaded. Not sure how data file became incorrect, but the reboot worked, all data sets accurate ready for Confidence Interval Tests. **Completely reformatted the schedule in MS Project.** The schedule dates remain the same as well as the work packages, but were not formatted properly and organized hierarchically according to the WBS. This fix allows the CPI function to reflect actual status more accurately. **CPI: 1** **84%Complete**	**CI tests will be performed and reviewed with G. Kretchik before including in final report**. Draft of paper will be ready to be sent to editor within the next 2 weeks. Continue to stay on schedule per PMP, no delays are expected based on risk evaluations. Possible early finish of deliverables. Currently right on schedule, per the project schedule which is at a quicker pace than the PPM's are scheduled in 686B.
Anticipated Changes/Key Risks/Corrective Actions	**Key Takeaways/Where Help Needed**
One of the data sets in excel was corrupt. Downloaded the original data over again and it corrected the issue. The data is now ready for statistical analysis. No further issues are anticipated.	Project documents are in great shape, and continue to develop ahead of PPM schedule. Paper is progressing nicely. **No assistance needed at this time.**

PM 686B Project Status Report Dashboard

Name: Crissy Ditmore Date: 10.23.2015

Project Title: Vanpool Research Project

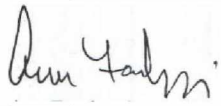
Synopsis of Project	Progress Since Last Report
A project to develop, administer, and analyze survey results from the self-reported stress levels of single occupant drivers and vanpool participants before and after their commute. The purpose of this study is to accept or reject the hypothesis that commuters who use vanpooling as their commute transportation mode have less stress than their single occupant driver counterparts.	**Twenty (20) pages of final report have been written**. Inline citations were added and the references section formatted to reflect the citations used. The TOC was created in automatic update form. Data analysis performed on the data sets, and inserted into formulas within Excel. PPM 2 submitted. "Go" approval for Phase One received. Updated the remaining PMP documents as well according to project plan ahead of scheduled PPM.
Current Status	**Forecast**
Researcher finalized all formulas and we performed spot checks that revealed inaccurate data in one of the sets. Went back to original Qualtrics data and downloaded and uploaded. Not sure how data file became incorrect, but the reboot worked, all data sets accurate ready for Confidence Interval Tests. **Completely reformatted the schedule in MS Project.** The schedule dates remain the same as well as the work packages, but were not formatted properly and organized hierarchically according to the WBS. This fix allows the CPI function to reflect actual status more accurately. **CPI: 1** **84%Complete**	**CI tests will be performed and reviewed with G. Kretchik before including in final report**. Draft of paper will be ready to be sent to editor within the next week. Continue to stay on schedule per PMP, no delays are expected based on risk evaluations. Possible early finish of deliverables. Currently right on schedule, per the project schedule which is at a quicker pace than the PPM's are scheduled in 686B.
Anticipated Changes/Key Risks/Corrective Actions	**Key Takeaways/Where Help Needed**
One of the data sets in excel was corrupt. Downloaded the original data over again and it corrected the issue. The data is now ready for statistical analysis. No further issues are anticipated.	Project documents are in great shape, and continue to develop ahead of PPM schedule. Paper is progressing nicely. **No assistance needed at this time.**

PROJECT CHARTER

VANPOOL RESEARCH PROJECT

VERSION: 9 REVISION DATE: 11.30.2015

Approval of the Project Charter indicates an understanding of the purpose and content described in this deliverable. By signing this deliverable, each individual agrees work should be initiated on this project and necessary resources should be committed as described herein.

Approver Name	Title	Signature	Date
Ann Fandozzi	CEO		1/28/2015
Jon Martz	Vice President Government Affairs		1/27/2015

Contents

Section 1. Project Overview

1.1 Problem Statement

Mode specific research relating stress levels before and after the commute is limited. Statistical research quantifying stress as a result of the commute is ongoing. After performing an exhaustive literature review on this topic the resulting lack of empirical data concerning Vanpools revealed a need to focus on this single mode type using Single Occupant Vehicle Commuters as the control population.

1.2 Project Description

This project will create a survey for existing commuters at a minimum of three California employers. The participants will report their stress level before and after their commute on a self-determined level of 1-10. The outcome of this research will provide baseline research data to determine stress levels based on SOV commuting and vanpool commuting.

1.3 Project Goals and Objectives

This project will determine if the mode of vanpooling affects the level of stress for employees both before and after work. The pre-work data can be used to determine future business decisions on how to approach new employer locations. The post- work data can be used to determine future user marketing strategies.

It is the goal of this project to perform research, and create a paper stating the observations of the study. This will be a baseline for future research and provide baseline data for vanpool specific research as a transportation mode. This project will coincide with the educational needs of the PM686A and B classes.

1.4 Project Scope

This project includes that management of the overall research and analysis of the data.

Project Includes
Development of questions for commuters
Determination of appropriate survey methodology
Survey of Commuters analyzed for not less than 14 days
Report of observed data
Re performing the survey if initial surveys do not provide statistically sound data

Project Excludes
Applications of how the data should be used in future business decisions (recommendations are permitted, but in broad idealistic terms)

Project Excludes
Inclusion of more than three companies for the first round of surveys. (Quality for the survey is defined as t least 2 statistically valid data sets at the end of the survey period. Follow up surveys are only permitted if the first round of surveys does not deliver the required results for analysis.)
Future or follow up surveys (not including secondary surveys if necessary due to statistical reliance)
Research on any other mode of transportation (carpool, bus, telework, etc.)

1.5 Success Criteria

The desired result for this research based project is to deliver vanpool specific statistical data. Acceptance or rejection of the hypothesis is not the basis for determining project success. Either outcome has desirable benefits since it would give direction to vanpool marketing and insight into user stress levels. Either outcome will answer questions the industry needs answers to, and can lay a foundation for future follow up research.

Participation by at least two, but no more than three companies that support the outreach to their employer base. Corporate "buy in" to support the project is essential. Companies should only be chosen if leadership agrees the employees should participate. The final selection of employer may change throughout the planning process in order to accommodate the schedule. Final choice of intended survey locations must be finalized no less than one week prior to starting the surveys.

1.6 Critical Success Factors

Project:

- Completion of all PPM Deliverables as outlined in the schedule with no less than 3 points given for any individual PPM.
- IRB submission by March 30, 2015
- Passage of all phase gates on PM686A
- Passage of all phase gates of PPM686B

Research:

- Acceptance by no less than two companies willing to allow surveys of employees
- Statistically sound survey results with 95% Confidence Intervals, or 5% Significance Levels once analyzed (follow up surveys must be performed with larger data sets until these levels are met. Only then is the information ready for publishing). Alternatively, a document could be published that states why these levels could not be met to infer a design for a future survey that would correct the deficiencies so that stress level can be appropriately analyzed.

1.7 Assumptions

The preferred methodology for administering the survey is via mobile application. Currently, there are vendors in the marketplace that offer this service. They are willing to provide this service for this particular survey.

Employees will respond to their employer request for reporting stress levels.

IRB will accept the chosen research methodology tools.

There will be an appropriate mix of SOV volunteers and vanpool commuter volunteers at each survey site. Appropriate for this matter is defined as percentage of participants reflective of the overall corporate population.

Section 2. Project Authority and Milestones

2.1 Funding Authority

Resources will be identified as necessary, and provided utilizing organizational assets when approved by the corporate stakeholder group. vRide Inc. is the funding authority, with CEO Ann Fandozzi as the Project Sponsor. Ann will be the final determining factor for resource allocation.

2.2 Project Oversight Authority

Crissy Ditmore will serve as the Project Manager. Crissy has full authority to respond to day to day needs of the research project, and may make changes to the schedule without approval from the stakeholder group. Only the Project Sponsor may assign any changes to the research topic.

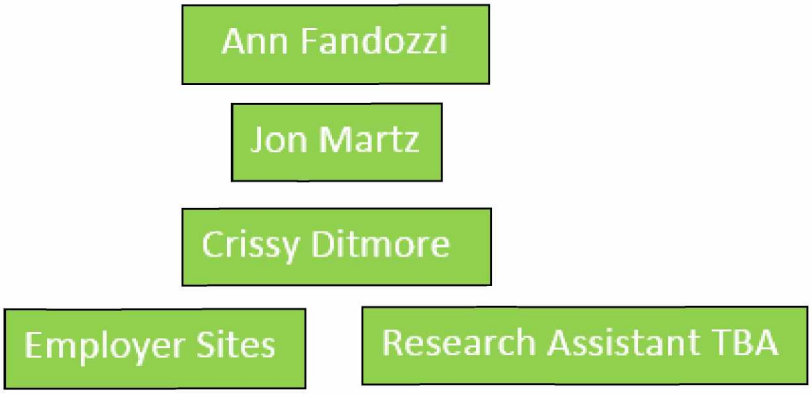
2.3 Major Project Milestones

Milestone/Deliverable	Planned Completion Date
Final Project Schedule (686A)	April 10, 2015
Final List of Research Questions	March 30, 2015
Start of survey	June 1, 2015
Report of Data Observed	November 20, 2015
Final Presentation	November 30, 2015

Section 3. Project Organization

3.1 Project Structure

The reporting structure of this project is outlined below:



3.2 Roles and Responsibilities

Role	Responsibility
Ann Fandozzi	Project Sponsor, Funding Authority
Jon Martz	Project Stakeholder, PM's oversight
Crissy Ditmore	Project Manager
Jack Gallagher (Research Assistant)	Dependent upon complexity of data, RA may be brought on to analyze the data set before PM writes the outcomes
Los Angeles World Airport (Employer A)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
Cal Tech (Employer B)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
JPL (Employer C)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
LinkedIn (Employer D)	Provide access to appropriate sample group of SOV commuters and vanpool commuters
Intuit (Employer E)	Provide access to appropriate sample group of SOV commuters and vanpool commuters

Role	Responsibility
Reserved	
Reserved	

3.3 Project Facilities and Resources

Any resources beyond those listed here must be requested and approved in writing by the Project Sponsor.

Resource Requirement	Responsibility
Recipient of Survey Data	PM has access to organization assets as required for this project. These assets are currently limited to customer data, use of assigned computer, and access to subject matter experts.
Survey methodology	PM to identify proper research tool to best suit the outcome of data desired. It is desired that commuters are able to post "real time" before and after their commute in order to retrieve the best data possible. If a mobile application for this purpose cannot be identified traditional survey options (Qualtrics, Survey Monkey, etc.) are acceptable.
Funding for incentives	vRide Corporate will provide no more than $2,000.00 for survey incentives.

Section 4. Research Information

Research Topic:
Compare the self-reported levels of commute related stress from commuters traveling to and from LAWA, Cal Tech, and JPL in the State of California by commuters from both vanpool and SOV modes.

Hypothesis:
Commuters that utilize vanpools to get to and from work have lower levels of stress upon reaching their destination than their single occupant vehicle counterparts.

Qualitative Research using quantities--- Could have correlational aspects.

Initial Literature Review:
An analysis of existing reports and peer reviewed journals published by the Transportation Research Board (TRB) and the Center for Urban Transportation Research (CUTR). Both are the preeminent sources for transportation and commute related data. Research revealed that vanpooling is mentioned among many documents, but does not provide any empirical data for vanpool as a mode, specifically. The previous research performed were primarily mentioned twice in articles from 1998, and 2006, both of which quote leadership from VPSI Inc. (vRide's previous branding). In all cases the information provided was best of the estimations of SME's and did not perform any type of actual vanpool user survey or analysis.

Section 5. Points of Contact

Identify and provide contact information for the primary and secondary contacts for the project.

Primary Contact	Name/Title/Organization	Phone	Email
Crissy Ditmore	Government Account Executive	619-980-0523	Crissy.ditmore@vride.com
Secondary Contact	**Name/Title/Organization**	**Phone**	**Email**
Jon Martz	VP Gov Affairs	248-597-3500	Jon.martz@vride.com

Section 6. Glossary

TDM: Transportation Demand Management

vRide: A Private Provider of Public Transportation by Vanpool

Vanpool: A group of volunteer commuters using a 7-15 passenger vehicle for the work commute leased by the private provider.

SOV: Single Occupant Vehicle

PS: Project Sponsor

PM: Project Manager

TRB: Transportation Research Board

CUTR: Center for Urban Transportation Research

SME: Subject Matter Expert

PMP: Project Management Plan

JPL: Jet Propulsion Labs

Section 7. Revision History

Identify document changes.

Version	Date	Name	Description
1	1.26.2015	Project Initiation	Initial Project Document for PS Approval
2.	2.17.2015	Milestone revision	Change schedule related deliverable (date), move relevant sections from Charter to PMP
3.	3.15.2015	Scope revision	Implement change and revise charter document to reflect inclusion of a third employer
4.	4.8.15	Milestone revision	Change milestone to reflect increased time to deliver final project schedule. Refined document to reflect changes to project to date as accepted by the PM
5.	7.15.15	Update Employer Site info	Update requirements to include provisions to define quality survey outcomes, more than the initial surveys needed to be done, and Charter must be updated to reflect those inclusions. *Note: Original Charter accounted for additional follow up surveys if initial surveys did not deliver statistically viable data. Once this was realized, all project documents were updated to reflect the changes. These changes were accepted as part of the original inclusions and change control process.
6.	9.14.15	Conformance	Ensure all project documents conform.
7.	10.5.15	Conformance	Add Research Assistant Name, conform to all other documents.
8.	11.4.15	Formal Edits	Ensure document is appropriate for publishing.
9.	11.30.15	Add Milestone	Final review showed the presentation was not listed as a milestone in the Charter, and it should have been since it is included in the PMP.

Section 7. Appendices

No appendices necessary to date for the Charter. All appendices and subsidiary project plans are in the Project Management Plan.

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vRide

Ann Fandozzi
President, Chief Executive Officer

January 29, 2015

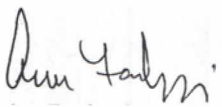
University of Alaska Anchorage
Project Management Department
LuAnn Piccard

Dear Ms. Piccard:

I have reviewed the Project Charter and background information concerning Crissy Ditmore's Capstone Project. The research relating to vanpooling will be of value to our industry, and vRide Inc. supports this project fully. Crissy has provided sufficient information for me to agree for her to move forward with this project, and as a result, move forward with her 686-A Capstone Class.

We look forward to the outcome of the surveys and the results of the observed data.

Respectfully yours,



cc: A. Fandozzi
C. Ditmore
J. Martz

UAA ESM & PM Program Support

From: Roger K Hull <rkhull@uaa.alaska.edu>
Sent: Wednesday, October 07, 2015 9:25 PM
To: Crissy Ditmore
Subject: RE: Research Analysis Tools Approval

Crissy,

Your research analysis approach and tools are approved.
You may attach this eMail to your PPM submission documents as evidence of formal approval.

Regards,

Roger

Roger K. Hull, PMP, CISM, CRISC
Instructor, PM Dept
UAA
rkhull@uaa.alaska.edu
907-786-1923 (office)
907-346-6280 (cell)

From: Crissy Ditmore [mailto:crissy.ditmore@vride.com]
Sent: Saturday, October 03, 2015 3:24 PM
To: Roger K Hull <rkhull@uaa.alaska.edu>
Subject: Research Analysis Tools Approval

Roger,

A discussed, I have conferred with Gary Kretchick on the appropriate data analysis tools that would be required to deliver the appropriate analysis of my survey material. We have decided to keep the focus of the paper very narrow, in keeping with the Project Scope. Therefore, the research tools that have been utilized to analyze the data sets are:
1- Initial daily averages to ensure response rates are appropriate.
2- Descriptive Statistics to report the generalized overall data, and summary statistics.
3- Confidence Intervals of the data as derived from the descriptive statistics. The CI was determined to be most appropriate for determining the hypothesis test on the average differences of the mean. For the report this is performed on each of the morning before and after as well as the evening before and after commutes. The formula for explaining the data is as follows:

ΔS VP
ΔS SO

Is there a statistical difference?

Key: Δ=Change (as averaged each day of the study before and after their commute)
S= Reported Stress
VP= Vanpool
SO= Single Occupant

Please respond to approve these research analysis tools for submission with PPM2.

Warm regards,

Crissy Ditmore

vRide Government Account Executive
310 K St Ste 200 Anchorage, AK 99501
(619) 980-0523

At vRide, we want to make sure that everyone is included in what we do, please let us know if we can provide an accommodation for your full participation.

Expectations for PM 686A and 686B Capstone Project Advising

Student Name: Crissy Ditmore **PM 686A or PM 6896B (Circle one) Semester:**_____

Area of Responsibility	Student	Primary Advisor (1 person)	Committee Members (2 people)	Instructor of Record (IOR) and Admin Staff
Project Management	**PRIMARY OWNER**	Coaching, feedback and assessment	Coaching, feedback and assessment input	
Communication and Stakeholder Management	• Clear description of project • Proactive selection of Advisor and Committee members • Demonstrate effective communication and stakeholder management by determining and coordinating necessary and agreed modes and setting expectations for timing, and emphasis or tailoring of feedback and communication across with PA and committee (and other stakeholders) • Provide regular status reports as agreed with PA and committee • Identify and resolve communication issues • Identify, balance and resolve	• Email confirmation of agreement to serve • Availability as agreed	• Email confirmation of agreement to serve • Availability as agreed	• Faculty specialties matrix • Session Lectures • Syllabus • Blackboard materials • Announcements • AV set up • Final presentation schedule and logistics • Student and committee support as requested • Adjunct Faculty appointment letters • Escalation path

	contradictory inputs • Discuss and get signatures for "Expectations" from student, advisor and committee members and submit to PM office.			
Project Deliverables	• Complete work per syllabus • Incorporate feedback from PA, committee and stakeholders			
Feedback	• Determine type, timing and format of feedback from PA and committee • Solicit, coordinate and integrate feedback from stakeholders, PA and committee for PPMs and final project deliverables • Identify, balance and resolve contradictory inputs	Provide agreed feedback on timely basis	Provide agreed feedback on timely basis	
Final Presentation	• Prepare • Present	• Attend • Provide Feedback	• Attend • Provide Feedback	• Coordinate schedule and logistics
Assessment and Grading		• Coordinate input from committee for 4 PPMs and final	Provide input to primary advisor for: 4 PPMs Final deliverables	• Input 4 PPMs and final deliverables scores to Blackboard

		project deliverables • Assignment of PPM scores • Provide scores to IOR • Go/No checkpoint recommendation • Assign final grade	Go/No checkpoints	• Ensure consistency across students • Communicate go/no-go decisions to students • Input final grade to UA Online
Administrative Documents	• GSP preparation and submission to PM Office • Signed Expectations agreement • IRB submittal (686A) • Apply for graduation (686B) • RSVP for Hooding and commencement (686B)			• Graduate Studies Plan (GSP signatures and processing • Include signed "Expectations" form in student file. • DF paperwork and annual progress report for students • Graduation Audit • Graduation Requirement Report (GRR) • Archive final project deliverables

Student is responsible for obtaining the following signatures and submitting completed form to PM office to include in student file.

I understand and agree to the expectations described above:

Student Signature: DocuSigned by: Crissy Ditmore 5694BA89B346439... Date: September 14, 2015

Advisor Signature: DocuSigned by: 421A15D2BD7142A... Date: September 11, 2015

Committee Member: DocuSigned by: Ludwin Piccard 3D1464B7E653467... Date: September 11, 2015

Committee Member: 6633442A9D3E47B... Date: September 11, 2015