



**Characteristics  
of Employee  
Transportation  
Coordinators**  
Center for  
Urban Transportation Research  
*July 2004*

*Prepared by*  
Nancy L. Brown, MBA, CAE  
Designs in Development, Inc.  
In collaboration with  
Harold T. Welch, Ph.D.  
High Performance Coaching

Post Office Box 4460 • Seminole, Florida, 33775 • (727) 398-5997  
Fax (727) 397-6497 • [designdev@aol.com](mailto:designdev@aol.com) • [www.ephilanthropy.com](http://www.ephilanthropy.com)  
For Dr. Welch: [hwelch@hpcoach.com](mailto:hwelch@hpcoach.com) • office (813) 966-7333

# Report on Characteristics of Employee Transportation Coordinators

## *Table of Contents*

Overview of Study .....	4
Overview of Instruments.....	5
Application and Findings.....	12
Summary of Conclusions.....	21
Recommendations.....	22
Researcher Credentials.....	24
Validity and Reliability of Instruments.....	26

## **Attachments**

<b>Attachment A:</b> Summary of Demographics Collected from POC.....	31
<b>Attachment B:</b> Profile of Organizational Characteristics (POC) Summary of Questions.....	33
<b>Attachment C:</b> Overview of CVAT Terms.....	35
<b>Attachment D:</b> Table Addenda.....	36

**Attachment D: Table Addenda detail, continued**

**Table 1:**  
Overview of FIRO-B Responses (n=15) .....37

**Table 2:**  
Comparison of FIRO-B Responses by Program Performance .....38

**Table 3:**  
Comparison of FIRO-B Responses by ETC-Supervisor Position .....40

**Table 4:**  
Comparison of This study With Other Studies Using FIRO-B .....41

**Table 5:**  
Overview of POC Responses (n=14).....42

**Table 6:**  
Difference between high/low performing program in how the work unit is seen now .....44

**Table 7:**  
Difference between high/low performing program in how the work unit should be.....46

**Table 8:**  
Difference between how ETCs and their supervisors perceive their work unit to be  
Now.....48

**Table 9:**  
Difference between how ETCs and their supervisors think their work unit should be .....49

**Table 10:**  
Overview of responses to demographic questions.....51

**Table 11:**  
Overview of CVAT Part 1 Responses on Personal Values (n=14) .....52

**Table 12:**  
Overview of CVAT Part 2 Responses on Work Unit Culture (n=14) .....54

**Table 13:**  
Difference between ETC and Supervisor perception of personal values .....56

**Table 14:**  
Difference between ETC and Supervisor perception of work unit culture.....58

**Table 15:**  
Difference in perception of personal values between high and low performing  
Programs ..... 60

**Table 16:**  
Difference in perception of work unit culture between high and low performing  
Programs .....62

**Table 17:**  
Chart III from DiSC -- the “official” report .....64

**Table 18**  
Chart I and II from DiSC -- anecdotal observations .....65

## Overview of Study

The goal of this study was to determine if differences in effectiveness of work site trip reduction programs (TRP) can be explained by the characteristics of Employee Transportation Coordinators (ETCs) and the relationships they have with their supervisors.

The process used for this investigation includes a study of the characteristics of organizations with the six most successful TRP participation metrics in comparison with the six organizations with the least successful TRP participation metrics. Also, by comparing personal characteristics of ETCs and their supervisors from the six most successful programs with personal characteristics of ETCs and their supervisors from the six least successful programs, we intend to indicate personal characteristics that may contribute to TRP effectiveness.

The study was undertaken to provide a statistical foundation to refute two null hypotheses:

1. There is no significant difference between selected characteristics of organizations with highly successful TRP metrics from organizations with low TRP metrics.
2. There is no significant difference between selected individual characteristics of ETCs from organizations with highly successful TRP metrics and ETCs from organizations with low TRP metrics.

Collection of data to study organizational or personal characteristics could have been accomplished by several approaches.

1. Referring to existing data-which documents culture change for organizations and performance appraisal feedback for individuals. This approach is cost effective and can be time effective with full cooperation from each participating organization, but comes with the problem of diverse expressions of collected information. Documentation regarding culture change will be tailored to each organization and some organizations will have no culture statement or internal evaluation. Performance appraisal criteria will normally be consistent within an organization but vary widely between organizations. Even if organizations share common descriptions the perception of standards of performance are not consistent between departments, let alone between companies.
2. The on-site observation by a researcher to gather organizational information and multiple feedback observations in the form of 360-degree tools used to assess characteristics of each participant. This approach provides optimum consistency of common, predetermined criteria, but is so expensive and time restrictive that it is only used for the most demanding or critical applications.
3. Collection of responses to common sets of questions by each participant. The use of self-assessment instruments is time efficient and provides effective data at a reasonable cost. Self-assessment tools rely on the candor and accuracy of participants and often depend on the assumption of confidentiality placed on individual feedback. Data from self-assessment instruments reflect opinions of participants and contain individual bias, baggage, and potential misperceptions of reality. For this reason, representation of an adequate sample of the defined population is needed.

## Overview of Instruments

The self-assessment feedback approach was selected for this study. Instruments were selected that could be made available on-line, would be relatively easy to administer, would provide data suitable to build statistical evidence, and that would provoke interest on the part of survey participants. The instruments included:

- DiSC by Inscape Publishing
- FIRO-B (Fundamental Interpersonal Relations Orientation – Behavior) by Consulting Psychologist Press administered through SkillsOne
- POC (Profile of Organizational Characteristics) based on the work of Dr. Rensis Likert in *The Human Organization*, administered by High Performance Coaching
- CVAT (Culture and Values Analysis Tool) by Dr. Reid Nelson, administered by High Performance Coaching.

Participants were contacted by the Center for Urban Transportation Research (CUTR) with an overview of the research project, the approximate time to participate, access to website information, and a commitment of individual confidentiality. Seventy participants were sought; 19 actually participated in the study and 18 completed all or some of the instruments.

### DiSC

At its most basic level, DiSC measures four factors of an individual's needs-driven behavior:

- **Dominance (D)** is the DiSC factor that relates to control, power and assertiveness.
- **Influence (i)** relates to an individual's approach to social situations, and an individual's desire to influence others.
- **Steadiness (S)** is the factor of patience, persistence and thoughtfulness.
- **Conscientiousness: (C)** describes a person's approach to structure and organization.

The instrument allows a person to project his or her perceived "needed" behavior in a situation and compares it with the instinctive response, to yield a composite view of the person in the position. The DiSC is typically used to help individuals determine their own needs-driven behaviors and learn to adapt their behaviors to the needs of others.

Upon completion of the DiSC instrument by an individual, the data is used to construct three graphs. A first graph (referred to as Graph I) charts perceived needed behavior in a given job environment, a second graph (referred to as Graph II) charts the instinctive response and a third graph (referred to as Graph III) develops a composite view, which is the information sent back to the person completing the instrument. In responding to the instrument, ETCs were asked to focus on "doing their jobs as an ETC." Supervisors were asked to focus on "supervising their ETC."

DiSC is one of several hundred needs-driven, behavior-based instruments available on the market. However, it is the only one of the instruments that has been validity- and reliability-tested successively through several stratified random samples of the US over its forty years of existence. The language in the instrument has also been adapted, as language utilization has changed over time. Its original creator, Dr. John Geier, a former professor at the University of Minnesota, found that Graph I tended to correlate with how people projected their jobs to be, because of a tendency to think more carefully about how a person “most” saw their job as opposed to how they functioned least in the position. He called Graph II “the instinctive response under pressure.” Graph III is the combination of the two, representing how a person is probably functioning in the role at the point at which they complete the instrument.

With the advent of the use of the computer, and with the instrument being taken in an unsupervised environment, Inscape does not “officially” claim that the differing charts mean anything. Anecdotally, however, many long-term administrators like Ms. Brown agree with the original instrument developer, Dr. John Geier, that Graph I correlates most closely to behaviors people perceive that they need to emulate within the focus, They also find that Graph II is more closely aligned with the instinctive response to pressure (and much less likely to change dramatically over time), and that Graph III provides insight into how well the subject is actually merging the wanted (projected) behaviors with his or her own more instinctive responses. While no research proves this fact, the additional graphs provide rich insight into individual persons, which can be especially helpful with a resulting small sample size such as the one resulting from this initial study.

There are thirteen possible DiSC “Classical Profile Patterns” which may more closely describe an individual’s behavior. Participants received a detailed report about their unique behavioral style. No style is better than another. The information sent included a description of the person’s needs-driven behavioral tendencies. The information also describes the person’s desired environment and - can help the participant discern what he or she can do to be more effective in the defined situation. For more information about the DiSC instrument refer to the section “Validity and Reliability Regarding Instruments.”

**FIRO-B (Fundamental Interpersonal Relations Orientation – Behavior)**

The FIRO-B is specifically concerned with individual interpersonal needs and how these needs show up in one-to-one relationships, and in groups. The FIRO-B provides insights into issues of organizational culture and team dynamics. This makes the FIRO-B especially valuable for leaders and team members.

FIRO-B describes interpersonal behavior in terms of three primary dimensions:

- Need for **Inclusion**, whether one wants to be “in” or “out” of a particular group
- Need for **Control**, whether one wants to be “up” or “down” (superior or subordinate)
- Need for **Affection** [openness], whether one wants to be “close” or “distant”

FIRO-B measures these three dimensions from two perspectives:

- Expressed behavior: behavior one feels most comfortable showing to others
- Wanted behavior: behavior one wants from others or to be received from others.

The FIRO-B yields six basic scores, including an *expressed* score for each dimension: inclusion (Ie), control (Ce), and affection (Ae), and a *wanted* score for each dimension: inclusion (Iw), control (Cw), and affection (Aw). In addition, there are *total* scores for each of the three dimensions; total inclusion (It), total control (Ct) and total affection (At). *There is also a total expressed behavior score (Te), a total wanted behavior score (Tw), and an overall total-total score combining both wanted and expressed scores (Tt).*

FIRO-B explains how personal needs affect interpersonal relationships. It provides a useful focus for leadership development, teambuilding, mentoring programs and organizational change. As applied to this study to assess characteristics that lead to effective or ineffective programs, there may be clues from contrasted scores of ETCs and their supervisors. An investigation will be made to discover if there are statistically significant differences between FIRO-B data and the level of program effectiveness.

The following table is a common arrangement for FIRO-B scores and illustrates abbreviations used with the data:

	Inclusion	Control	Affection	Totals
Expressed	<b>Ie</b>	<b>Ce</b>	<b>Ae</b>	<b>Te</b>
Wanted	<b>Iw</b>	<b>Cw</b>	<b>Aw</b>	<b>Tw</b>
Totals	<b>It</b>	<b>Ct</b>	<b>At</b>	<b>Tt</b>

Abbreviated descriptions associated with FIRO-B scores:

Instrument Scores	Low	Medium	High
Individual cells (Ie, Iw, Ce, Cw, Ae, Aw)	Score = 0-3 Individual rarely displays the behaviors.	Score = 4-6 The behaviors will be a noticeable characteristic of the individual but only some of the time.	Score = 7-9 The behaviors are noticeably characteristic of the individual in most situations.
Total expressed (Te)	Score = 0-9 Not comfortable initiating social behavior.	Score = 10-18 Vary extent to which initiates action; depends on who it is and context.	Score = 19-27 Enjoy initiating behavior with others.
Total wanted (Tw)	Score = 0-9 Not comfortable relying on others for what you need. Do not expect much from others.	Score = 10-18 Vary in the extent to which you are comfortable being reactive and reliant on others.	Score = 19-27 Rely quite a bit on others and feel comfortable about accepting behaviors from others.
Total need (It, Ct, At)	Score = 0-6 Indicates that individual is indifferent to satisfying this need.	Score = 7-12 Suggests that individual will characteristically express or display the related social behavior to fulfill this need.	Score = 13-18 Indicates that individual will consistently pursue this need by expressing or eliciting the interpersonal behaviors related to these needs.
Overall need (Tt)	Score = 0-17 Involvement with others is not a reliable source of need satisfaction. Individual tends to need privacy to do best work. Considers self an introvert.	Score = 18-35 Involvement with others is sometimes a source of satisfaction, depending on individuals and context. May consider self to be introverted or extroverted, contingent on the situation.	Score = 36-54 Finds involvement with others enjoyable and satisfying. Works best in a group. Likes to work on teams and to solve problems through discussion. Considers self to be an extrovert.

Descriptions of scores based on narrative from "Introduction to the FIRO-B in Organizations" by E. Schnell and A. Hammer, 1993, Consulting Psychologist Press, Inc.

For more information about the FIRO-B, please refer to the section "Validity and Reliability Regarding Instruments."

### **POC (Profile of Organizational Characteristics)**

In his 1961 book, *New Patterns of Management*, Rensis Likert identified four prototype organizations, named Systems I, II, III and IV defined by the degree to which they were open, participative, and satisfying to work in. These organizational levels are:

System I	—	Authoritative
System II	—	Paternalistic
System III	—	Consultative
System IV	—	Participative

Dr. Likert further identified management style as the key variable. Dr. Likert was able to provide evidence that as organizations moved toward System IV on this scale, they had lower costs and higher output than those tending toward System I.

The POC provides an efficient method to collect workplace perceptions of how the organization looks to an individual, and how that individual believes it should appear. The processes used by Dr. Likert included control, influence, decision-making and goal setting. The POC incorporates six process characteristics that can be observed in an organization. These include Leadership, Motivation, Communication, Decisions, Goals, and Controls.

The POC collects feedback on the six characteristics in terms of the perspective of how the organization *is seen now* and the perspective of how the organization *should be*. An overall POC Index is calculated for each perspective and for each characteristic. The POC is most useful when there are sufficient responses to provide sample data for predictions of a general population. Is the Appendix B reference still current? Appendix B contains the questions used for this study and is a reference when investigating the data:

Questions 1, 2, and 3 deal with the organizational characteristic of **Leadership**; questions 4, 5, and 6 deal with **Motivation**; questions 7 through 10 collect feedback of organizational **Communication**; questions 11 and 12 focus on **Decisions**; 13 and 14 on **Goals**; and questions 15 and 16 on **Controls**.

For the initial phase of this study, using feedback from ETCs and their supervisors, comments from POC data will only describe the perceptions of management style from their singular perspective. This will have value as long as resulting descriptions of these perspectives are contained within the scope of comparing program leadership perceptions and not confused with providing projections of existing organizational characteristics. The desire of this study is to discover POC data with sufficient correlation to program effectiveness data to act as a catalyst for increased dialogue, vis-à-vis understanding perceived organizational characteristics that enhance or support successful trip reduction programs.

For more information about the POC, please refer to the section, “Validity and Reliability Regarding Instruments.”

### **CVAT (Culture and Values Analysis Tool)**

Organizational culture is more complex than one survey instrument can hope to address, but the CVAT provides a solid foundation to begin to recognize important components of an organization's culture.

Assessing perceptions of what is rewarded and important within an organization provides insights that can be used to style communications in a way that compliments cultural characteristics. CVAT consists of two interlocking instruments supported by licensed software.

- 1) The **Personal Value Profile** (CVAT Part 1) measures participants' perceptions of personal values (PV).
- 2) The **Aggregate Value Profile** (CVAT Part 2) also uses the same dimensions and format but relates to participants' perceptions of work unit values or culture (UC). The CVAT identifies 16 dimensions that fall within four categories. These categories are identified below, with expanded descriptions in the attachments.

- WORK: Effort (A), Time (B), Finish Job (C), Quality (D);
- RELATIONS: Affect (E), Empathy (F), Sociability (G), Loyalty (H);
- CONTROL: Dominance (I), Status (J), Political (K), Leader (L);
- THOUGHT: Abstract (M), Plan/Organize (N), Exposition (O), Flexibility (P).

Data from the administration of Part 1 and Part 2 of the CVAT are used to consult with executives and others whose personal styles and assumptions of organizational culture may influence organizational effectiveness and change. Part 1 is focused on the individual and can be used to illustrate personal values (PV). Part 2 is focused on the individual's perceptions of their work environment and can be used to illustrate work unit culture (UC).

Within the scope of this study, the CVAT is an effective tool to assess core values of ETCs and their supervisors, to assess the level of similar and dissimilar values, and to obtain perceptions of organizational culture. The CVAT software facilitates comparisons of responses and will statistically match similar responses. We anticipated that responses from incumbents from organizations with effective programs might be statistically similar to each other and different from responses from incumbents from organizations with ineffective programs. Regrettably, not enough participants completed this portion of our battery to provide data to differentiate characteristics of successful programs from less effective programs.

For more information about the CVAT, please refer to the section "Validity and Reliability Regarding Instruments."

The DiSC and the FIRO-B focus more on the characteristics of the individual, while the POC and CVAT focus more on the characteristics of the organization for which the individual works. The combination of these four instruments was selected for this study to provide information that could be compared to develop an overall profile of the study participants and their perceptions of their work sites. Finding consistencies (or inconsistencies) among the instrument data uses the concept of "multiple sources of evidence" in the development of cases studies.

As a “trial,” we determined that it would be best to utilize several different instruments to see which provided the greatest insight. It is common in studies of this nature to utilize several instruments. As stated elsewhere in this document, we found that the willingness of the participants to actually *complete* the instruments to be the most limiting factor. Supervisors, in particular, perhaps because of their many responsibilities, were often unwilling to commit the time required.

## Application and Findings

Statistical protocols were set up in anticipation of a minimum of 30 responding work sites, paired to include a supervisor and an Employee Transportation Coordinator (ETC) for a total of 60 participants. A web site, hosted by the National Center for Transit Research (NCTR), was constructed which contained information about the purpose of the study and links to the four feedback instruments. Each link contained instructions for completing each feedback instrument. NCTR staff recruited the study participants with contact information for ETCs provided by the Washington State DOT trip reduction database of participating work sites.

Recruitment included initial phone calls with a follow-up letter that contained detailed information and an Informed Consent form. Participant recruiters relied upon the ETC to provide contact information for his or her immediate supervisor. Individuals interested in participating signed the Informed Consent form and emailed or faxed it back to the recruiter. Upon sending his or her informed consent, the participant received emails that provided individual pass codes and information for accessing the link to the feedback instruments. Toll-free telephone conferences were offered to all participants for providing verbal instructions for accessing and completing the instruments. Participants were provided contact information if they had any questions or problems.

The study attracted 18 usable responses for DiSC, 15 usable responses for the FIRO-B and 14 usable responses for the POC and CVAT.

The design of the study required each participant to commit two hours of time completing instruments. Ideally, a supervisor and his or her ETC from the same work site would participate; however, each would complete the instruments separately and independently of the other. Many of the ETC supervisors, who have many other responsibilities, did not choose to participate for a range of reasons given to study directors. Of the eight participating sites ranked as top performing (rated “A” by CUTR) for vehicular trip reduction, only 25% (2) of the supervisors participated. Due to the resulting small sample size, the researchers are not able to apply statistical protocols to predict individual or work unit characteristics of a larger population. However, inferences may be extracted from the feedback contained in the instrument responses collected. These inferences might support or direct future investigations relevant to this study.

It appears that the behavioral style represented by the “i” in the DiSC instrument (Influencing) correlates with the more successful programs. Additionally, although the sample size is extremely low, it appears that the lack of Expressed Affection (Ae) in FIRO-B scores may align with lower performing programs. This hypothesis could be tested in further studies.

Additionally, as indicated in the section entitled “Recommendations” in the demographics the Profile of Organization Characteristics, the (POC) could be restructured by eliminating some questions and adding others to help evaluate outside influences, such as how far a work site is from public transportation, or how supportive top management is perceived to be of the program.

### **DiSC Scores: Paired supervisors and their ETCs**

The trip reduction program requires influencing a change in the travel behaviors of people. An instrument that measures, in part, how people perceive the needs of the job and balance them against their own need-driven behaviors is the DiSC Personality Profile. One of the initial hunches of the study was that the behavioral work style of the ETC may be associated with the outcome of the TRP.

D is associated with task-oriented behaviors such as dominating and delegating.

"i" is associated with people-related behaviors such as influencing and inducing.

S is associated with people-related behaviors such as steadiness and security.

C is associated with task-oriented behaviors such as conscientiousness and control.

While the study sample for the DiSC™ is too small to draw conclusions, a possible pattern emerges from the available data. It is interesting to note that of the five pairs of study work sites for which there were data for both the ETCs and their supervisors, the site that had the highest performance as measured by vehicle trips reduced was also the only site in which both the ETC and the supervisor had a high “i” (Influence) work style as one of their primary needs-driven behaviors. (A person with a high “i” personality is one who enjoys influencing others. They seek contact with all types of people, look for opportunities to generate enthusiasm and accomplish goals through others. They are adept at dealing with people and articulate ideas well.) Of course, one example such as this cannot lead to any conclusions, but the recognition of both the supervisor and the ETC that active *influencing* is a key factor *does* support our “hunch.”

### ***Pairs of ETCs and Supervisors***

<u>Program Rating</u>	<u>ETC</u>	<u>Supervisor</u>
<b>Highest performing organizations</b>		
A	C, i	i, D
A	i, S	S, C
<b>Lower performing organizations</b>		
B or C	S, C	i, C
B or C	S, D	D, C
B or C	S, C	D, i

### ***DiSC Scores: ETCs alone***

DiSC scores for ETCs alone provided much greater insight into the behavioral mindset of the ETC. Although the sample size was too small to be considered other than anecdotal, the results were revealing in that the high “i” (active Influencing) appeared consistently.

The study contained 13 ETCs who completed the DiSC instrument. In examining these scores it is important for the reader to remember that the Graph III score represents a combination of how the employee projects how he/she should *most* be, plus how he/she feels he/she is *least*, as defined by a specific job focus (“my job as an ETC”). Actual scores of ETCs as compared to the CUTR worksite rating based on vehicle trips reduced are explained in the graph on the following page.

**The following graph illustrates the difference in DiSC scores between high and lower performing programs for ETCs alone:**

	<b>Trip Reduction Ranking</b>	<b>DiSC Scores Graph III</b>
<b>high performing</b>		
E02	A	C, i (supervisor also has high i)
E17	A	i, S
E14	A	i, S
E04*	A	S, D (i graph I)
E10	A	i, S
E08	A	C, i
E15	A	S, C
E09*	A	C, D (i graph I)
<b>low performing</b>		
E22	B	S, C
E21	B	S, D
E11	B	S, C
E24	C	S, C
E25	F	i, S

Looking at the ETC data apart from the data for the supervisors, the predominant work style for all ETCs in higher performing programs (VTR  $\leq 30$ ) was “i”.

- Two of the high performing programs for which the ETCs did not score a high “i” (as indicated in their Graphs III) as a predominant needs-driven work style indicated that they believed a high “i” personality was needed to do the job of the ETC well (as indicated in their Graphs I), meaning that they were attempting to change their natural needs-driven behaviors to meet the needs of the job.
- The predominant work style for ETCs in the lower performing programs VTR > 30 was “S” (Steadiness). A person with a high “S” personality is one who performs in a consistent, predictable manner. He or she prefers stable harmonious work environments with standard operating procedures and predictable routines. This ETC is task-oriented rather than people-oriented. He or she is uncomfortable with change and desires an environment in which the status quo is maintained.

Not fitting the above pattern are two lower performing organizations with ETCs with high “i” work styles. Obviously, a high “i” ETC work style might not be the only predictor of TRP effectiveness. However, this finding can anecdotally provide insight into other factors that may impact TRP effectiveness.

- In the first case, the ETC reportedly expressed a lot of frustration over lack of management support. Therefore, it might be proposed that no matter how effective the ETC, the ETC might not be able to overcome unsupportive management.
- In the second case, the exception concerned the lowest performing work site. Its ETC has a high “i” personality but it is not believed that this is evidence that the hunch is wrong. The work site is located far away from the nearest central business district, which has limited transit service and free plentiful parking not controlled by the organization. It is suggested that this work site’s TRP performance might actually rate well in comparison with other work sites in similar conditions.

Also not inconsistent with our “hunch” was one work site that was among the highest performing trip reduction programs. This program has an ETC with her primary needs-driven work style measured as a high “C” and her secondary work style as “i”. The “C” style includes adherence to key directives, accuracy and attention to detail. In reference to the qualities needed in an effective ETC, her supervisor’s (perhaps unenlightened) reported opinion was that that the most important activity of the ETC was to “...serve as a compendium of knowledge. We don’t need a cheerleader.”

- Other incentives were known to be at work: this work site has among the largest numbers of employees in the study, and they *all* receive a full transit subsidy. Top management, reportedly, actively advocates for the TRP, which *may* be unusual in some other organizations.
- While the persuading of a large percentage of employees to use alternative transportation has already been accomplished in this organization, we have been advised that there are still employees who do not use alternative transportation but could.
- This ETC reportedly further said that she is most proud when she succeeds in convincing someone to participate in trip reduction programs. Reportedly, supervisory guidance appears to reward employees who already want to participate in such programs. (For supervisory approval, administration of the transit passes is apparently what this ETC must do well.) So, in this case, her high “C” work style may be very effective: the ETC recognizes that influencing more employees to use alternative transportation is her goal.

Based on the above examples, one may conclude that the ETC work styles that best match the culture of the work site may enable an ETC to be effective in his or her position.

In conclusion, while the study sample for the DiSC™ is too small to draw definitive conclusions, a pattern appears to emerge from the available data that high “i” ETC work style, wherein encouragement is practiced and found, is one of the keys to the most effective trip reduction programs.

### **Conclusions regarding DiSC Scores**

While data is insufficient to draw actual conclusions, we can infer from both of the tables above that recognition of the ETC’s role as one who actively manages processes in a persuasive way is essential to project success. This could perhaps be tested with a larger sample using only the DiSC instrument, or preferably the DiSC and the POC.

### **FIRO-B (Fundamental Interpersonal Relations Orientation - Behaviors) Scores**

In general, respondents to the surveys appear to be more reserved, or private, than the population at large. This conclusion is inferred from the low overall FIRO-B when compared to other studies using FIRO-B data (Table 4). As a group, the participants are likely to be choosy about how, when, and where they associate with others. They may also be cautious about how they use or share authority.

It should be noted that the FIRO-B scores represent patterns of interpersonal behavior and expectations of those persons evaluated. It may appear at a quick glance that the DiSC and FIRO-B information are in conflict. Any difference is minimized as one considers that the FIRO-B scores reflect the unique interpersonal needs that strongly motivate each of us. Within a work setting is only one of a wide range of situations and environments.

The DiSC, however, utilizes a very specific task focus upon application (“my job as an ETC” or “my job supervising an ETC”). DiSC celebrates the fact that, although each individual may have a greater “comfort level” with one or more behaviors, *individuals can change and adapt behaviors* to adjust to varying situations. This, in fact, appears to be what is happening with the more successful ETCs. Although, as a group, ETCs tend to be more private according to their FIRO-B scores, they are willing to *ADJUST their behaviors* to improve program outcomes by influencing and showing affection (openness) to others in the process of recruitment, solicitation, and related ETC communications.

### **The following is a recap of the meaning of the FIRO-B score categories:**

#### **Inclusion**

“Expressed inclusion” (Ie) is consistently greater than “wanted inclusion” (Iw) (Table 1), indicating a greater comfort with initiating contact with other people while wanting privacy for themselves. This score is amplified in Table 2 with the comparison of ETC responses from high performing programs to responses from lower performing programs. The mean for “wanted inclusion” (Iw) of ETCs from high performing organizations is 3.4, and the mean wanted inclusion (Iw) of ETCs from low performing organizations is 0.8. ETCs with both high performing programs and low performing programs are comfortable with including others (Ie). However, the ETCs with low performing programs are even more private, and may be perceived as insincere due to their preference to not be included by others.

#### **Control**

The combination of expressed control and wanted control is described as Control total (Ct) and is the lowest factor for the group of respondents (Table 1). Control is also a topic of interest in Table 2, in that Control total (Ct) for participants from the top ranked programs and lower ranked programs both have a mean response that can be considered placed in the lower-middle of the scale. However, the score is the lowest of the three dimensions for the ETCs with high performing programs and it is the highest of the three dimensions for the ETCs with the low performing programs. This finding implies that either inclusion or affection (openness) may be more of a success factor than expressing or wanting control over events or the ability to influence others.

### Affection

Affection is the dimension with the highest mean score, implying that this need is of greatest importance to the group of respondents. In an organizational setting, affection is frequently referred to as openness, warmth, or friendliness. The expressed and wanted scores, (Ae) and (Aw), appear at a low-medium level compared to other data sub-sets. Persons with a desire to express affection usually want to appear to be open and warm to others.

When overlaid with the DiSC scores for the most successful ETC sites rated most highly for the most vehicular trips reduced, ETCs scored significantly higher in the expressed Affection category (Ae), and essentially the same in the expressed Inclusion category (Ie).

There is data from the FIRO-B that infers that some ETCs may lack commitment to their program. They may be seen as doing an assigned task because it is part of their job, not necessarily because they believe in it. This inference is based on low mean expressed control (Ce) of 2.4, and low mean wanted inclusion (Iw) of 2.4. They will tend not to be the people who have a strong need to be in control of events or outcomes and will often like their privacy. This might be summed up as, “Whatever; I’ll be in my office.”

This idea is reinforced by the relatively high scores in both the “Now” and “Should” of the POC. There is a consistent level of satisfaction with the existing management style. The ETCs may come from organizations that utilize highly effective participative processes and practices, or the ETC may have figured out how to meet their personal needs within the existing culture.

### **Conclusions regarding FIRO-B Scores**

While the sample size is too small to make statistical predictions about a population, there does seem to be an indication that low expressed Affection (Ae) scores align with low performance of transportation programs, as compared with the mean of 4.3 expressed Affection for the more highly performing programs with the mean of 2.5 for those not performing as highly. The following is a more in-depth explanation of the FIRO-B scores and how they differ from, and measure different qualities, than the DiSC scores:

## Comparison of DiSC and FIRO-B Scores

		TRP	FIRO-B					
	Ranking	DiSC Scores Graph III	Ie	Ce	Ae	Iw	Cw	Aw
<b>high performing</b>		<b>bolded #s higher than avg</b>						
E02	A	C, i	5	0	5	6	2	4
E17	A	i, S	4	3	3	8	1	7
E14	A	i, S	7	3	8	8	1	3
E04*	A	S, D (i graph I)	4	3	7	7	5	7
E10	A	i, S	6	1	4	0	2	4
E08	A	C, i	3	5	3	0	3	0
E15	A	S, C (supervisor has high i)	4	2	3	0	6	5
E09*	A	C, D (i graph I)	4	2	1	0	2	1
		<b>Mean</b>	<b>4.6</b>	<b>2.4</b>	<b>4.3</b>	<b>3.6</b>	<b>2.8</b>	<b>3.9</b>
<b>low performing</b>								
E22	B	S, C	6	1	5	2	4	6
E21	B	S, D	4	3	1	0	3	5
E11	B	S, C	5	0	3	4	8	3
E24	C	S, C	4	3	1	0	1	3
E25	F	i, S	n/a	n/a	n/a	n/a	n/a	n/a
		<b>Mean</b>	<b>4.8</b>	<b>1.8</b>	<b>2.5</b>	<b>1.5</b>	<b>4.0</b>	<b>4.3</b>

From the comparison above, one can see that in addition to a tendency to express “Affection” among the highly-performing program DiSC respondents, the FIRO-B respondents of lower performing programs tended to express less tendency toward expressing affection toward others. This is illustrated by “Affection expressed and wanted” scores which appear in the bolded boxes.

### POC (Profile of Organization Characteristics) Scores

The POC provides an efficient method to collect workplace perceptions of how the organization looks to an individual, and how that individual believes it should appear. As stated previously, the processes used by Dr. Likert included Control, Influence, Decision-making and Goal-setting. The POC incorporates six process characteristics that can be observed in an organization. These include Leadership, Motivation, Communication, Decisions, Goals, and Controls.

Scores from the POC were generally high (Table 5), reflecting positive perceptions by the ETCs of their work environment and the predominant management style. Tables 6 through 9 summarize POC responses. (Add “POC” in the headings for these tables).

This high score can also be a reflection of sample bias, as those willing to participate in the survey might express a positive attitude toward the program and be more willing to participate in the study. Also, participants in this study were simply responding to a questionnaire with little

organizational context; whereas, participants in previous POC studies were taking part in a larger organizational change intervention and, therefore, more discriminate about responses to describe organizational behaviors.

Scores for “How should the organization be” are typically high because most people want to contribute to the work activity and want their work units to be participative. Scores for “How do you see the organization now” are often lower than the scores for the participants in this study. Since participants in this study responded with small valued difference between “now” and “should be,” they may be working in positions that offer considerable autonomy, or they may have learned how to work within their system to obtain the autonomy they desire (referencing the FIRO-B responses). A particular management style did not emerge from this study.

<b>Organizational Categories</b>	<b>This study</b>	<b>POC Study A</b>	<b>POC Study B</b>	<b>POC Study C</b>	<b>POC Study D</b>	<b>POC Study E</b>	<b>POC Study F</b>
Leadership	5.7	4.5	4.1	4.0	2.8	5.0	4.7
Motivation	5.7	4.2	3.9	4.4	2.9	4.7	4.4
Communications	5.2	4.2	3.8	4.0	2.6	4.8	4.2
Decisions	5.	3.7	3.2	3.5	2.2	4.0	4.1
Goals	5.1	4.2	4.0	4.8	3.2	4.9	4.7
Controls	4.8	3.9	3.6	4.2	3.1	4.5	4.0
Overall	5.3	4.2	3.8	4.2	2.8	4.8	4.4

<b>POC Study</b>	<b>n=</b>	<b>Description of sample</b>	<b>Study Year</b>
CUTR	14	Participants in This study	2004
A	24	Managers & supervisors at power plant	1990
B	34	Technical professionals at nuclear plant	1994
C	12	Office/clerical at power plant	1990
D	16	Union employees at transmission site	1996
E	15	Nuclear engineers at nuclear plant	1994
F	9	American Red Cross managers	1999

Scores for questions 8 and 10 of this study have the greatest gap between “now” and “should.” They both come from the Communication category. This group of survey participants thinks that the style and effectiveness of communications in their organization can be improved.

### **CVAT (Culture and Values Analysis Tool) Scores**

General findings from the CVAT (Tables 13 and 14) are that supervisors tend to value “Control” and “Relations” more than non-supervisors and high performing programs have ETCs who value “Control” and “Relations” more than lower performing program ETCs (Tables 15 and 16).

Overall, study participants value relations (CVAT Part 1; Table 11) greater than their work unit rewards relations-building behaviors (CVAT Part 2; Table 12). Also, study participants indicate that their work unit rewards control (CVAT Part 2) greater than they personally value control (CVAT Part 1).

The sum of categories from Table 11 indicates that Work is the highest valued category of behavior for the group of participants; followed by Relations, Control and Thought. In Table 12, we can see that Work is considered to be the highest rewarded category by work units, but Relations is last in perceived organizational culture importance. The dimensions with the greatest difference between personal values and work unit culture (PV-UC) are Loyalty (H), Leader (L), and Political (K). Loyalty is more important to the individual than it is perceived to be for the organization, Leadership and political savvy are both considered to be more important to the organization than to the individual.

CVAT data is supported by DiSC and FIRO-B results to make a distinction between ETCs with higher performing programs from ETCs with lower performing programs. Personal values of ETCs with high performing programs favor Relations over Work. ETCs with lower performing programs favor Work over Relations (Table 15). These results are supported by the FIRO-B (Table 2) by a distinction between mean wanted inclusion (Iw) of 3.4 for ETCs with high performing programs, and 0.8 for ETCs with lower performing programs. The lower level of needed inclusion reflects the relationship values by the CVAT score.

It is interesting to note that political savvy (K) within organizations is considered to be of greater importance to ETCs with high performing programs than to ETCs with lower performing programs (Table 16). Flexibility (P) is also considered more important to ETCs with high performing programs than ETCs with lower performing programs. Political savvy and flexibility would help persons navigate cultures that value Work over Relations even when it is clear to the employees that relations are critical to the successful completion of the ETC job (as correlated by DiSC and FIRO-B Scores.)

The category of Control as part of the organizational culture (Table 12) was exceeded only by the category of Work. Statements such as, “Respect for authority is important here,” “Status is important in this organization,” “It’s important to know the ropes to get ahead,” and “It is important to display leadership,” received high scoring for being selected above other options.

The topic of Control is reinforced by the FIRO-B scores. Expressed Control (Ce) is the need to have control over events or people and is tied for the lowest mean score (Table 1). As a group, the surveyed ETCs as well as their supervisors appear to resist having control, and as a group they have little value for control.

Yet, ETCs with high performing programs see that their organization rewards the dimensions that identify the category of Control (Table 16). The study implies that ETCs with a better understanding and acceptance of political and control factors, with the skill and desire to influence, and the rewards that go with their success will not settle for “Whatever,” but will strive to reach goals that they believe are important.

When the CVAT scores of ETC personal values are compared to the CVAT scores of supervisor personal values, we find that ETCs as a group appear to strongly value Relationships over Work, while ETC supervisors value the dimensions of Work and Thought over Relations (Table 13). This difference is reinforced by the FIRO-B scores that compare ETCs and supervisors (Table 3). The greatest difference of mean scores is in wanted Inclusion (Iw); mean ETC score is 2.9 and mean supervisor score is 0.3. Relationships and being included is more important to the ETC individual contributors than it is to the supervisors.

## Summary of Conclusions

- 1) The data sample is too small to draw statistical conclusions, but large enough to make inferences that can be further evaluated through continued research.
- 2) It appears that there is a correlation between the DiSC behavior of Influencing (high “i”) and with successful ETCs. Additionally, FIRO-B scores indicate that ETCs associated with transportation programs identified as less effective have lower need of expressed Affection (openness) than ETCs associated with effective transportation programs. An assumption can be inferred that ETCs with characteristics of low influence and little openness may negatively impact an ETC program.
- 3) The CVAT scores indicate that survey participants place low relative value on Control. The options of “I like to be respected,” “I am somewhat status minded,” “I know how to beat the system when necessary,” and “I like to lead,” were not selected by many respondents as part of their personal values. This was the lowest category selected by this entire sample of respondents including ETCs and supervisors. This is echoed by the FIRO-B mean score for expressed Control which, along with wanted Inclusion, was the lowest of all other interpersonal dimensions.
- 4) The study, as designed (2 hours for completion), was too long to gain the desired participation and needs to be shortened. Streamlining the use of the POC, DiSC, and FIRO-B, in that order, would be recommended and would result in reducing the time commitment by half. For instance, in a larger study the “should be” questions from the POC could be eliminated to help reduce the time required to complete the instrument.
- 5) In the CVAT, political savvy (K) within organizations is considered to be of greater importance to ETCs with high performing programs than to ETCs with lower performing programs (Table 16). Flexibility (P) is also considered more important to ETCs with high performing programs than ETCs with lower performing programs. Political savvy and flexibility would help persons navigate cultures that value Work over Relations even when it is clear to the employees that relations are critical to the successful completion of the ETC job (as correlated by DiSC and FIRO-B Scores.)

## Recommendations

- 1) Evaluate a larger sample of ETCs, using the premise that “expressed Affection” (FIRO-B) and “understanding for the need for Inducement and influencing” (DiSC) are essential to our targeted participants, successful ETCs. Market participation by emphasizing the potential for recognition by their peers and positive acknowledgement from their supervisors.
- 2) Reduce the number of instruments to two or three. Drop the CVAT, cut down the POC, and don’t make it a requirement for the supervisors to participate. The time it took to move through the process is believed to be problematic. Feedback to the participant recruiter indicated that the time commitment to participate (a minimum of 2 hours before reading the feedback results and optionally attending a telephone debriefing) was too much. Only two-thirds of the study sample participating completed all the instruments. Supervisors, in particular, were often too busy to participate. Since time is a factor, and since Supervisors are less likely to participate, the most insightful instruments are the POC, DiSC and FIRO-B, in that order. All three can be administered in less than one hour.
  - The POC is the instrument that is most flexible and can be adjusted to provide the required demographics. It can be shortened by eliminating the questions about how the organization “should be,” and retain the focus on how the organization is perceived “now.” The POC would provide more valuable insight into variations of management style with a larger sample. In a larger sample in more diverse communities, the POC process can be further adapted to include demographic and geographic information needed to investigate how external factors such as the availability of mass transit can influence reduced vehicular trips.
  - The DiSC gives powerful information about how the ETCs specifically interpret the behaviors needed on the job and whether they are attempting to adapt their natural behaviors, if need be, to achieve them. There was a high correlation with the “i” behavior in the highly performing groups.
  - The FIRO-B is most powerful when used to compare the supervisor’s psychological needs to those of the ETC in dimensions of Inclusion, Control and Affection. We had hoped to achieve some insight into how the relationship between the supervisor and the ETC impacted program success; however, the resulting pair sample was too small to find any statistical significance. In this study, we did find some strongly suggestive correlations for expressed Affection (openness) when comparing only ETC scores between work groups with highly effective programs and those with less effective programs. This illustrates how the FIRO-B can be useful to investigate fundamental differences between groups of participants.
  - The CVAT is by far the longest and most complex instrument. While it would provide valuable information to future studies about the values of successful organizational cultures (whether Work, Relations, Control or Thought is valued most highly), we have concluded that it can’t reasonably be administered over the Internet due to its length. Eliminating it would cut the time commitment significantly.

- 3) Overlay externally gathered information concerning community capacity for mass transit against future participants in a study. Even in the same geographic area, work with this limited sample could not account for variations that might have occurred because a surveyed plant was next door to a mass transit stop, for example. (See item #2 above for discussion of questions that might be added to POC to help differentiate such factors.)
- 4) Perhaps a more limited attempt could be made to evaluate supervisor/ETC pairs. Ideally this may need to be done in person. The overriding question is, “What relationship dynamics between the ETC and their supervisor leads to an effective program or interferes with obtaining an effective program?”
- 5) Participation in the study, whether through pairs or ETCs, could possibly be enhanced by working through local ride-share group networks. If there are any meetings where ETCs are physically grouped together, perhaps administering the instruments in person to a “captive” audience and then sending them the results, with offer of a telephone conference call recap, could be more effective from a time standpoint.
- 6) CUTR staff as well as our own staff noted that there has been password confusion between the automatically generated password required by DiSC and the password to get into the website assigned by CUTR. In consulting with DiSC, we learned that they have developed and twice beta-tested a new procedure, which could be used to circumvent these administrative problems. With this methodology, the University would be set up with a sub account, however, the data could still be controlled by the interpreting researcher. There is a \$1,500 front-end cost to accomplish this and therefore the procedure would not have been cost-effective for a small sample. With several hundred people participating, it could be worthwhile to investigate.

## Researcher Credentials

### **Harold T. Welch, Ph.D., SPHR**

President, High Performance Coaching

Harold Welch has broad experience initiating organizational effectiveness processes for national and multi-national applications and for independent, private enterprises. Working as both an internal and an external consultant, Harold has over twenty years of experience providing coaching and consulting services for companies in oil and gas, health care, manufacturing, utility, transportation, government, construction, entertainment, and non-profit industries.

Dr. Welch has a degree in Management with a master's degree in Counseling and a doctorate in Adult Education. He is a Certified Career Management Practitioner (CMP) and Senior Professional in Human Resources (SPHR), and a professional member of the American Counseling Association (ACA).

#### Experience with FIRO-B

- Used with executive coaching, team building, and career development, Dr. Welch has applied his knowledge of the FIRO-B to overcome organizational performance obstacles and barriers to more healthy relations between people. The FIRO-B has proven to be a useful tool to demonstrate how conflicting interpersonal needs can interfere with authentic communications.

#### Experience with POC

- Dr. Welch has used the POC instrument for organizations with 3,000 survey participants. Data has been gathered to provide a reference for the senior management team to monitor the impact of existing management style and to initiate management changes for desired effect. One senior manager remarked, "This POC feedback gives me a map of the organization that helps see and understand how the management tools I use really changes the way people work."

#### Experience with CVAT

- The CVAT has given valuable feedback on an individual, team, and organizational level. When used with a small organization with 56 employees, data from the CVAT highlighted fundamental differences that had developed between departments and work groups. Employees had conflicting perceptions of what the senior staff considered to be the most important issues facing the organization. By using the CVAT the senior management team was able to draft a culture change process that incorporated the diverse values that was fragmenting the organization. The result was a cohesive and consistent message from senior management, acceptance of a unified purpose with common objectives, and movement toward a desired organizational culture.

**Nancy L. Brown, MBA, CAE**  
President, Designs in Development, Inc.

Nancy L. Brown has 18 years of consulting experience ranging from team building to conflict resolution and from strategic planning to staff and volunteer training. She has worked with over 200 units of government, schools, professional and non-profit associations. Certifications include Certified Association Executive, preparing her to develop associations of industry professionals in fields ranging from accounting to tennis. Ms. Brown has special expertise in developing voluntary boards, whether advisory or governing, of the sort often approving community transportation initiatives. Clients have included County Planning Departments and Community Commuter Service advocacy organizations.

Ms. Brown speaks nationally, is the author of a text entitled *Increasing Board Effectiveness* which is used in the University of South Florida 's non-profit certificate program in conjunction with the DiSC instrument. She has also served as an adjunct professor for Indiana University and St. Petersburg College.

#### Experience with the DiSC

Ms. Brown has administered the DiSC instrument to several thousand persons over the last 18 years. She has used it for team building, and in counseling environments to compare an employee's perception of his/her job with that of an employer's. She has also used it as a basis for volunteer training and for sales training within organizations.

Ms. Brown is also certified to administer the Myers Briggs Personality Profile and also uses it in coaching and training environments in combination with the DiSC instrument.

## Validity and Reliability of Instruments

*DiSC (excerpted from Inscape Publishing, 2800 Series, Research Report)*

### DiSC

#### *Validity*

There are many ways to measure validity. One approach is to determine the extent to which the association among scores represents the theory and model on which the instrument is based.

In the DiSC model, Scales D (Dominance) and S (Steadiness) are, to some degree, opposites. So, we would expect to find that those two scales will be somewhat inversely related (negatively correlated).

In the same way, Scales i (Influence) and C (Conscientiousness) are, to some degree, opposites. We would also expect them to be inversely related.

If each scale measures something different from other scales, the correlation among scales should be smaller than the reliability of the individual scale. This condition is met when the value of a reliability coefficient is significantly larger than any of the correlations in the same row and column as that number.

The reliability table below shows reliability coefficients along with inter-scale correlations, to reveal the relationships found for the sample. Note that the reliability coefficients have been adjusted using the Spearman-Brown Formula to compensate for any underestimation due to scale length.

### DiSC

**Table 3. Adjusted Validity Coefficients and Inter-Scale Correlations Among Total Scores (N=812)**

	D-Most	i-Most	S-Most	C-Most	D-Least	i-Least	S-Least	C-Least
D-Most	<b>.92</b>							
i-Most	-.07	<b>.89</b>						
S-Most	-.73	-.21	<b>.88</b>					
C-Most	-.18	-.63	.11	<b>.84</b>				
D-Least	-.79	-.04	.73	.26	<b>.92</b>			
i-Least	.10	-.67	.13	.56	-.07	<b>.85</b>		
S-Least	.73	.18	-.74	-.20	-.78	-.15	<b>.88</b>	
C-Least	.33	.60	-.33	-.64	-.46	-.56	.33	<b>.86</b>

(Note: Adjusted reliability coefficients are shown in bold along the diagonal of the table. Inter-scale correlations are shown below the diagonal.)

## Results Summary

The 2800 Series of the *Personal Profile System*<sup>®</sup> used in this study is considerably more reliable than the 24-box *Personal Profile System* 6.1 instrument had been marketed previously. For comparison purposes with 24-box instruments, reliabilities of the 24-box DiSC<sup>®</sup> instrument are given below.

Comparing results in Table 4 with those shown in Table 3 above, you will note that reliabilities were significantly improved for i and C scales. Reliability of C-Most went from .36 to .72 and C-Least from .52 to .74. Similarly, i scale reliabilities increased to .79 for i-Most and .74 for i-Least.

### Reliability of 24-Box DISC Instruments

**Table 4. Reliabilities of 24-Box DISC Instruments**

D-Most	.79	D-Least	.76
i-Most	.50	i-Least	.47
S-Most	.61	S-Least	.59
C-Most	.36	C-Least	.52

### Reliability of *Personal Profile System*<sup>®</sup> 2800 Series (N=812)

As shown on Table 2, Graph III reliabilities range from .85 to .92. Commonly accepted standards require learning instruments to demonstrate reliabilities above .70. The results obtained on the *Personal Profile System* 2800 Series are considered to be very good.

## ***FIRO-B (Fundamental Interpersonal Relations orientation - Behaviors)***

### Validity

- Content validity: determined by showing how well the content of the test samples the class of situations or the subject matter about which conclusions are to be drawn. Content validity is a property of all legitimate scales.
- Concurrent validity: showing how well test scores correspond to measures of concurrent criterion performances or status. Refers to studies that attempt to demonstrate differences, on the basis of the measuring instrument, between already existent groups or between people with already know attitudes. To demonstrate the FIRO-B ability to measure interpersonal relations, there should be evidence that parallel assumptions related to all situations in which the interpersonal element is significant. Studies are presented that include an investigation of FIRO-B and political attitudes, occupational choice, and conformity behavior. These studies represent several different areas where there was an opportunity to measure concurrent validity. Schutz, W. *FIRO: A Three-Dimensional Theory of Interpersonal Behavior*. Will Schutz Associates, Inc. 1958. Chapter 4, pp. 66-80.
- Predictive validity: showing how well predictions made from the test are confirmed by evidence gathered at some subsequent time.

- Construct validity: evaluated by investigating what psychological qualities a test measures, for example, by demonstrating that certain explanatory concepts account to some degree for performance on the test. Essentially, it is a validation of the theory underlying the test. “Since FIRO-B is designed to test a theory, virtually every study in this book is relevant to predictive [and construct] validity.” (Schutz, p. 77.)

Reliability

- Coefficient of Internal Consistency: the measure based on internal analysis of data obtained on a single trial. Essentially, this measure indicates the degree to which the items are homogeneous, or measuring the same thing. The most usual test for internal consistency is the split-half method, the correlation between scores on two halves of the test.

The usual criterion for reproducibility is that 90 percent of all responses are predictable from knowledge of scale scores. The FIRO-B scales were developed on about one thousand subjects and the reproducibility computed for the remainder of the sample. The reproducibility for all scales is very high and consistent over all samples. These reproducibility scores are the coefficients of internal consistency.

Scale	Reproducibility	No. of Subjects
Ie	.94	1615
Iw	.94	1582
Ce	.93	1554
Cw	.94	1574
Ae	.94	1467
Aw	.94	1467
Mean	.94	1543

Guttman, L. “The basis for scalogram analysis.” In S. Stouffer et al., Measurement and Prediction, Princeton, N.J.: Princeton Univ. Press, 1950.

***Profile of Organizational Characteristics (POC)***

Validity

Chapters 3 and 4 of The Human Organization: Its Management and Value contain information about validity, but not expressed as coefficients. For example, information about the Weldon Plant study shows the improvement in the profile with related performance improvements. Seashore and Bowers published additional data on the Weldon plant in a 1970 paper, “Durability of Organizational Change” (*American Psychologist*, 25-3, March 1979). Even more supporting data on linking management style to performance improvement is provided in New Ways of Managing Conflict, Likert and Likert, (New York: McGraw-Hill Book Co., 1976).

Concurrent validity requires a survey have empirical association with some criterion or "gold standard" (DeVellis, 1991). This requires identification of an established, generally accepted test (Litwin, 1995). A high correlation coefficient between the survey and the standard test suggests

good concurrent validity. To validate the Organizational Culture Assessment (OCA), the results were compared to the Likert POC. The correlation between the OCA data and the Likert POC data is .95. An analysis of variance produced a significant F-value of .000, indicating that the OCA and the Likert POC are related. Analysis of the residuals indicated the errors are normally distributed and that the order of the model is correct. The high correlation and the ANOVA indicate that the OCA and POC have high concurrent validity.

### Reliability

A reliable survey is consistent in what it measures. The type of reliability used is internal consistency reliability. Internal consistency uses a single survey to determine the degree to which the questions in the survey are measuring the same thing. The methods used for measuring internal consistency are split-half reliability. The Human Organization: Its Management and Value, Likert, Rensis, (New York: McGraw-Hill Book Co., 1967), Chapter 7, gives reliability data or inter-correlations from which reliability can be computed or estimated. The 18-item Form S usually yields split-half reliability in the .90 to .96 range when applying the Spearman-Brown formula for estimating the reliability from the r between two halves of the form.

### ***Culture and Values Analysis Tool (CVAT)***

#### Rational and Accountability

The CVAT uses dimensions and sub-dimensions to describe individual priorities that determine a personal values map. Convergence of Iterated Correlations (CONCOR) statistical applications are then utilized to describe a culture model of a group of members based on the summary of individual value choices. The CVAT protocol is able to discern how organizations and people handle trade-offs as they are required to deal with organizational forces that require choices of action or response.

Universal cultural themes involve selections or the prioritization of choices between people orientation and production orientation at an individual level (Blake and Mouton 1964; Larson et al. 1976; Nystrom, 1978).

Three principal forces that exist in organizations create tension within the individual and in the organization. David McClelland (1961) identifies a need for achievement, need for affiliation, and need for power as the basic forces underlying human motivation. Alderfer (1969) also identifies three basic needs (existence, relatedness, and growth) which can be loosely related to power or security, relations, and task achievement.

The CVAT captures these forces in dimensions referred to as Work, Relations, and Control. An additional CVAT dimension is added to capture information about cognition or thought, a fundamental theme within organizational settings that frequently clashes with the other values categories (Nelson 1997). Each dimension is then identified by four sub-dimensions providing 16 themes that are usually contradictory but occasionally complementary. Responses to questions about these sub-dimensions provide a means to apply statistical analysis of clusters of similar responses to describe values and subsequent culture.

CONCOR is an algorithm developed by sociologists at Harvard and is commonly used in analyzing social networks and is applied in the CVAT to locate clusters of individuals with similar opinions. CONCOR works by comparing each respondent's scores on all 16 CVAT dimensions with every other person's scores. When CVAT responses are clustered into groups of individuals with statistically similar responses of value profiles the researcher will then determine from demographic information whether there is evidence of cultural disparity between the groupings.

Alderfer, Clayton L. 1969. An empirical test of new theory of human needs. *Organizational Behavior and Human Performance*, May: 142-175.

Blake, Robert R., and Jane W. Mouton, 1964. *The managerial grid*. Houston: Gulf.

Larson, Lars R., Jerry G. Hunt, and Richard H. Osborne. 1976. The great hi-hi leader behavior myth: A lesson from Occam's razor. *Academy of Management Journal*, December: 628-641.

McClelland, David C. 1961. *The achieving society*. Princeton, NJ: Von Nostrand Reinhold.

Nelson, Reed E., and K. Michael Mathews. 1991. The social networks of high performing organization. *Journal of Business Communications*, 28: 367-386.

Nystrom, Paul C. 1978. Managers and the great hi-hi leader myth. *Academy of Management Journal*, June: 325-331.

## **Attachment A: Summary of Demographic Information Collected from POC**

1. What is your age group?
  1. under 25 (0)
  2. 26-35 (4)
  3. 36-45 (4)
  4. 46-55 (3)
  5. over 55 (3)
  
2. Which response best describes your education level?
  1. No college. (0)
  2. Some college with no degree, or 2-year degree. (4)
  3. Bachelor-level degree (four year). (5)
  4. Master-level degree or above. (5)
  
3. Which response best describes the functional area of your education?
  1. Business/Economics (8)
  2. Education/History/Social Science (1)
  3. Engineering (2)
  4. General education (2)
  6. Political Science/Law (1)
  
4. How many total years work experience do you have?  
37, 35, 31, 30, 30, 30, 23, 22, 20, 17, 16, 15, 8, 4,
  
5. How many years have you worked for this organization?  
27, 20, 17, 12, 11, 10, 9, 7, 7, 5, 5, 4, 4, 2
  
6. How many years have you been designated ETC or supervised the ETC position?  
10, 10, 7, 6, 3, 3, 3, 3, 2.5, 2.5, 2.4, 2.4, 2, 1.5
  
7. Which response best describes your functional work area?  
Accounting, Finance, Bookkeeping, Payroll (1)  
Administration, Facilities, Health & Safety (3)  
Consulting (1)  
General staff role, Executive Assistant (3)  
Manufacturing (1)  
Procurement, Purchasing, Warehouse (3)  
Production/Operations, customer service (2)
  
8. The Employee Transportation Program at this location satisfies the intent of the program.  
Strongly Agree (6)  
Agree (7)  
Disagree (1)  
Strongly Disagree (0)

9. Local managers support this program in a way that contributes to its success.  
Strongly Agree (6)  
Agree (7)  
Disagree (1)  
Strongly Disagree (0)
10. It is clear that top managers believe this program is important.  
Strongly Agree (2)  
Agree (11)  
Disagree (1)  
Strongly Disagree (0)
11. There is adequate funding for the success of this program.  
Strongly Agree (4)  
Agree (8)  
Disagree (1)  
Strongly Disagree (1)
12. Employees consider the purpose of this program to be important.  
Strongly Agree (3)  
Agree (9)  
Disagree (1)  
Strongly Disagree (1)
13. Local managers and supervisors consider this program to be important.  
Strongly Agree (2)  
Agree (12)  
Disagree (0)  
Strongly Disagree (0)
14. My other work priorities are such that I have an appropriate amount of time for this program.  
Strongly Agree (3)  
Agree (10)  
Disagree (1)  
Strongly Disagree (0)

## **Attachment B: Profile of Organizational Characteristics (POC) Summary of Questions**

Survey participants respond to the following questions with a Likert scale ranging from 0 to 8. Part “a” of each question asks how the respondent perceives the work unit now. Part “b” of each question asks how the respondent thinks it should be.

### Topic: Leadership

1. a) How much confidence and trust is generally shown in subordinates?  
b) How much confidence and trust should be shown in subordinates?
2. a) How free do subordinates feel to talk to superiors about their work?  
b) How free should subordinates feel to talk to superiors about their work?
3. a) How often are the ideas of subordinates sought and used constructively?  
b) How often should the ideas of subordinates be sought and used constructively?

### Topic: Motivation

4. a) In your organization, which of the following is the predominant form of motivation: fear, threats, punishment, rewards, or involvement?  
b) In your organization, which of the following should be the predominant form of motivation: fear, threats, punishment, rewards, or involvement?
5. a) Where is there a true sense of responsibility for the organization's level of performance?  
b) Where should there be a true sense of responsibility for the organization's level of performance?
6. a) How much cooperative teamwork exists in this organization?  
b) How much cooperative teamwork should exist in the organization?

### Topic: Communication

7. a) What is the general direction of the flow of information needed for decisions about work processes and priorities?  
b) What should be the general direction of the flow of information needed for decisions about work processes and priorities?
8. a) How is the communication of information from upper levels of the organization generally received by lower levels of the organization?  
b) How should the communication of information from upper levels of the organization be generally received by lower levels of the organization?
9. a) How accurate is upward communication?  
b) How accurate should upward communication be?
10. a) How well do superiors understand the problems faced by subordinates?  
b) How well should superiors understand the problems faced by subordinates?

Topic: Decisions

11. a) At what levels are decisions made in your organization?  
b) At what levels should decisions be made in your organization?
12. a) How often are subordinates involved in decisions that determine the processes and procedures of their work?  
b) How often should subordinates be involved in decisions that determine the processes and procedures of their work?

Topic: Goals

13. a) How are performance goals usually set?  
b) How should performance goals usually be set?
14. a) How much do subordinates strive to achieve the organization's goals?  
b) How much should subordinates strive to achieve the organization's goals?

Topic: Controls

15. a) Where is responsibility for review and control functions found in the organization?  
b) Where should responsibility for review and control functions be found in the organization?
16. a) How are cost, productivity, and other reports containing control data used?  
b) How should cost, productivity, and other reports containing control data be used?

## Attachment C: Overview of CVAT Terms

<b>WORK</b>	<b>Task Orientation</b>
A. Effort	Sweat of the brow, often greatest when time is at stake.
B. Time	Speed orientation; need to get things done now; the "executive trot".
C. Finish Job	Priority given to finish tasks; drive for closure; end justifies the means.
D. Quality	Emphasis on time or finish job robs from ability to achieve total quality.
<b>RELATIONS</b>	<b>Relates to Voluntary Connections With Others</b>
E. Affect	Getting warmth, intimacy. Brings one close to others to <u>get</u> nurturance.
F. Empathy	Desire to understand and care for. Brings closeness to <u>give</u> nurturance.
G. Sociability	Focuses on closeness to groups rather than individuals.
H. Loyalty	Emphasizes durable, long-lasting closeness to people or organizations.
<b>CONTROL</b>	<b>How You Attempt to Influence Your Environment</b>
I. Dominance	Imposing one's will openly and without contrivance.
J. Status	Create symbolic inequalities between individuals.
K. Political	Imposing one's will principally through manipulation or leverage.
L. Leader	Secures control through charisma or "referent" power.
<b>THOUGHT</b>	<b>Cognition, Thinking in Rational or Creative Terms</b>
M. Abstract	Deals with generalities and big picture concepts; vision.
N. Plan/Organize	Tends to focus on details and order; objectives.
O. Exposition	Deals with the transmission of produced ideas.
P. Flexibility	Individual creativity or organizational adaptability.

## Attachment D: Table Addenda (Repeated)

### Attachment D: Table Addenda detail, continued

### Attachment D: Table Addenda detail, continued

<b>Table 1:</b>	
Overview of FIRO-B Responses (n=15) .....	37
<b>Table 2:</b>	
Comparison of FIRO-B Responses by Program Performance .....	38
<b>Table 3:</b>	
Comparison of FIRO-B Responses by ETC-Supervisor Position .....	40
<b>Table 4:</b>	
Comparison of This study With Other Studies Using FIRO-B .....	41
<b>Table 5:</b>	
Overview of POC Responses (n=14).....	42
<b>Table 6:</b>	
Difference between high/low performing program in how the work unit is seen now .....	44
<b>Table 7:</b>	
Difference between high/low performing program in how the work unit should be.....	46
<b>Table 8:</b>	
Difference between how ETCs and their supervisors perceive their work unit to be Now.....	48
<b>Table 9:</b>	
Difference between how ETCs and their supervisors think their work unit should be .....	49
<b>Table 10:</b>	
Overview of responses to demographic questions.....	51
<b>Table 11:</b>	
Overview of CVAT Part 1 Responses on Personal Values (n=14) .....	52
<b>Table 12:</b>	
Overview of CVAT Part 2 Responses on Work Unit Culture (n=14) .....	54
<b>Table 13:</b>	
Difference between ETC and Supervisor perception of personal values .....	56
<b>Table 14:</b>	
Difference between ETC and Supervisor perception of work unit culture.....	58
<b>Table 15:</b>	
Difference in perception of personal values between high and low performing Programs .....	60
<b>Table 16:</b>	
Difference in perception of work unit culture between high and low performing Programs .....	62
<b>Table 17:</b>	
Chart III from DiSC -- the “official” report .....	64
<b>Table 18</b>	
Chart I and II from DiSC -- anecdotal observations .....	65

**Table 1: Overview of FIRO-B Responses**

<b>Code</b>	<b>Ie</b>	<b>Ce</b>	<b>Ae</b>	<b>Iw</b>	<b>Cw</b>	<b>Aw</b>	<b>Te</b>	<b>Tw</b>	<b>Tt</b>	<b>It</b>	<b>Ct</b>	<b>At</b>	<b>Tt</b>
E02	5	0	5	6	2	4	10	12	22	11	2	9	22
E04	4	3	7	7	5	7	14	19	33	11	8	14	33
E08	3	5	3	0	3	0	11	3	14	3	8	3	14
E09	4	2	1	0	2	1	7	3	10	4	4	2	10
E10	6	1	4	0	2	4	11	6	17	6	3	8	17
E11	5	0	3	4	8	3	8	15	23	9	8	6	23
E14	7	3	8	8	1	3	18	12	30	15	4	11	30
E15	4	2	3	0	6	5	9	11	20	4	8	8	20
E17	4	3	3	8	1	7	10	16	26	12	4	10	26
E21	4	3	1	0	3	5	8	8	16	4	6	6	16
E22	6	1	5	2	4	6	12	12	24	8	5	11	24
E24	4	3	1	0	1	3	8	4	12	4	4	4	12
S12	3	1	3	1	4	5	7	10	17	4	5	8	17
S20	6	1	3	0	2	5	10	7	17	6	3	8	17
S26	3	8	2	0	1	0	13	1	14	3	9	2	14
Mean	4.5	2.4	3.5	2.4	3.0	3.9	10.4	9.3	19.7	6.9	5.4	7.3	19.7
s.d.	1.2	2.1	2.1	3.2	2.1	2.2	3.0	5.3	6.6	3.8	2.3	3.5	6.6
d (e-w)	2.1	-0.6	-0.4										

**Table 1 Footnotes:**

Ie = expressed Inclusion

Ce = expressed Control

Ae = expressed Affection (openness)

Iw = wanted Inclusion

Cw = wanted Control

Aw = wanted Affection (openness)

It = total Inclusion

Ct = total Control

At = total Affection (openness)

Te = Total expressed need

Tw = Total wanted need

Tt = Overall Total score

Refer to narrative on FIRO-B instrument for further description of elements.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

s.d. = standard deviation. The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data.

d (e-w) = delta, or difference, between mean “e” (expressed) scores and mean “w” (wanted) scores.

**Table 2: Comparison of FIRO-B Responses by Program Performance**

<b>Top</b>	le	Ce	Ae	lw	Cw	Aw	Te	Tw	Tt	lt	Ct	At	Tt
E08	3	5	3	0	3	0	11	3	14	3	8	3	14
E09	4	2	1	0	2	1	7	3	10	4	4	2	10
E14	7	3	8	8	1	3	18	12	30	15	4	11	30
E17	4	3	3	8	1	7	10	16	26	12	4	10	26
S12	3	1	3	1	4	5	7	10	17	4	5	8	17
Mean	4.2	2.8	3.6	3.4	2.2	3.2	10.6	8.8	19.4	7.6	5.0	6.8	19.4
d (e-w)	0.8	0.6	0.4										
<b>Middle</b>													
E02	5	0	5	6	2	4	10	12	22	11	2	9	22
E04	4	3	7	7	5	7	14	19	33	11	8	14	33
E10	6	1	4	0	2	4	11	6	17	6	3	8	17
E15	4	2	3	0	6	5	9	11	20	4	8	8	20
E22	6	1	5	2	4	6	12	12	24	8	5	11	24
Mean	5.0	1.4	4.8	3.0	3.8	5.2	11.2	12.0	23.2	8.0	5.2	10.0	23.2
d (e-w)	2.0	-2.4	-0.4										
<b>Bottom</b>													
E11	5	0	3	4	8	3	8	15	23	9	8	6	23
E21	4	3	1	0	3	5	8	8	16	4	6	6	16
E24	4	3	1	0	1	3	8	4	12	4	4	4	12
S20	6	1	3	0	2	5	10	7	17	6	3	8	17
S26	3	8	2	0	1	0	13	1	14	3	9	2	14
Mean	4.4	3.0	2.0	0.8	3.0	3.2	9.4	7.0	16.4	5.2	6.0	5.2	16.4
d (e-w)	3.6	0.0	-1.2										
Top-Bot	-0.2	-0.2	1.6	2.6	-0.8	0.0	1.2	1.8	3.0	2.4	-1.0	1.6	3.0

**Table 2 Footnotes:**

Ie = expressed Inclusion

Ce = expressed Control

Ae = expressed Affection (openness)

Iw = wanted Inclusion

Cw = wanted Control

Aw = wanted Affection (openness)

It = total Inclusion

Ct = total Control

At = total Affection (openness)

Te = Total expressed need

Tw = Total wanted need

Tt = Overall Total score

Refer to narrative on FIRO-B instrument for further description of elements.

Mean: arithmetic mean: the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

s.d. = standard deviation. The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data.

d (e-w) = delta, or difference, between mean “e” (expressed) scores and mean “w” (wanted) scores.

Top-Bot = Mean scores of participants representing five organizations with highest ranking of transportation program effectiveness minus the mean score of participants representing five organizations with lowest ranking of transportation program effectiveness.

**Table 3: Comparison of FIRO-B Responses by ETC-Supervisor Position**

<b>ETC</b>	Ie	Ce	Ae	Iw	Cw	Aw	Te	Tw	Tt	It	Ct	At	Tt
E02	5	0	5	6	2	4	10	12	22	11	2	9	22
E04	4	3	7	7	5	7	14	19	33	11	8	14	33
E08	3	5	3	0	3	0	11	3	14	3	8	3	14
E09	4	2	1	0	2	1	7	3	10	4	4	2	10
E10	6	1	4	0	2	4	11	6	17	6	3	8	17
E11	5	0	3	4	8	3	8	15	23	9	8	6	23
E14	7	3	8	8	1	3	18	12	30	15	4	11	30
E15	4	2	3	0	6	5	9	11	20	4	8	8	20
E17	4	3	3	8	1	7	10	16	26	12	4	10	26
E21	4	3	1	0	3	5	8	8	16	4	6	6	16
E22	6	1	5	2	4	6	12	12	24	8	5	11	24
E24	4	3	1	0	1	3	8	4	12	4	4	4	12
Mean	4.7	2.2	3.7	2.9	3.2	4.0	10.5	10.1	20.6	7.6	5.3	7.7	20.6
d (e-w)	1.8	-1.0	-0.3										
<b>Supv</b>													
S12	3	1	3	1	4	5	7	10	17	4	5	8	17
S20	6	1	3	0	2	5	10	7	17	6	3	8	17
S26	3	8	2	0	1	0	13	1	14	3	9	2	14
Mean	4.0	3.3	2.7	0.3	2.3	3.3	10.0	6.0	16.0	4.3	5.7	6.0	16.0
d (e-w)	3.7	1.0	-0.7										
ETC-Sup	0.7	-1.2	1.0	2.6	0.8	0.7	0.5	4.1	4.6	3.3	-0.3	1.7	4.6

**Table 3 Footnotes:**

- Ie = expressed Inclusion
- Ce = expressed Control
- Ae = expressed Affection (openness)
- Iw = wanted Inclusion
- Cw = wanted Control
- Aw = wanted Affection (openness)
- It = total Inclusion
- Ct = total Control
- At = total Affection (openness)
- Te = Total expressed need
- Tw = Total wanted need
- Tt = Overall Total score

Refer to narrative on FIRO-B instrument for further description of elements.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

s.d. = standard deviation. The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data.

d (e-w) = delta, or difference, between mean “e” (expressed) scores and mean “w” (wanted) scores.

ETC-Sup = Mean scores of participating ETCs minus the mean scores of Supervisors of ETCs.

**Table 4: Comparison Trip Reduction Program (TRP) With Other Studies Using FIRO-B**

	Ie	Ce	Ae	Iw	Cw	Aw	Te	Tw	Tt	It	Ct	At	Tt
TRP Study (n=14)	4.5	2.4	3.5	2.4	3.0	3.9	10.4	9.3	19.7	6.9	5.4	7.3	19.7
Ed. Administrators (n=104)	5.9	4.7	4.4	4.6	5.5	5.1	15.0	15.2	30.2	10.5	10.2	9.5	30.2
Teachers (n=677)	5.2	3.1	3.7	3.4	5.1	4.3	12.0	12.8	24.8	8.6	8.2	8.0	24.8
Traveling Salesmen (n=39)	6.4	5.6	6.1	7.0	4.4	6.9	18.1	18.3	36.4	13.4	10.0	13.0	36.4
Creative Architects (n=40)	2.7	5.4	2.6	1.7	3.1	4.4	10.7	9.2	19.9	4.4	8.5	7.0	19.9

**Table 4 Footnotes:**

Source: Will Schutz, Ph.D., “FIRO Awareness Scales Manual,” Table 4: FIRO-B Scores for Occupational Groups, Consulting Psychologists Press, Inc., Palo Alto, CA, 1978, pg. 10

Descriptive groups were selected to provide comparison with similar, small and moderate size samples of workplace professionals.

- Ie = expressed Inclusion
- Ce = expressed Control
- Ae = expressed Affection (openness)
- Iw = wanted Inclusion
- Cw = wanted Control
- Aw = wanted Affection (openness)
- It = total Inclusion
- Ct = total Control
- At = total Affection (openness)
- Te = Total expressed need
- Tw = Total wanted need
- Tt = Overall Total score

Refer to narrative on FIRO-B instrument for further description of elements.

**Table 5: Overview of POC Responses  
(n=14)**

Now All	1. a)	2. a)	3. a)	4. a)	5.a)	6.a)	7.a)	8.a)	9.a)	10.a)	11.a)	12.a)	13.a)	14.a)	15.a)	16.a)
E02	5	5	6	5	2	6	5	5	6	5	4	6	5	6	3	4
E04	5	7	6	7	7	7	7	6	5	3	5	5	5	5	3	7
E10	5	5	5	7	7	5	5	5	5	5	4	4	6	6	5	5
E11	5	6	6	6	5	4	4	5	5	4	5	5	3	5	4	4
E14	5	4	4	6	5	6	7	4	6	6	5	3	3	7	7	5
E17	7	4	3	7	6	6	3	3	6	1	2	2	7	7	7	5
E21	5	6	7	7	6	5	6	5	6	5	5	7	1	5	5	4
E22	8	8	8	7	5	5	3	5	5	5	7	5	7	5	5	3
E24	5	7	5	7	5	7	7	5	7	3	7	3	5	5	5	5
E25	4	5	6	3	7	5	7	4	7	6	5	5	5	5	3	5
S12	7	6	7	5	5	6	7	5	5	5	5	5	5	7	3	5
S20	7	7	5	7	7	6	7	6	7	7	6	7	7	7	7	6
S23	4	5	4	4	3	3	3	3	5	7	5	3	1	2	3	3
S26	7	7	7		7	7	5	3	7	7	7	7	5	5	7	5
mean	5.6	5.9	5.6	6.0	5.5	5.6	5.4	4.6	5.9	4.9	5.1	4.8	4.6	5.5	4.8	4.7
Should All	1. b)	2. b)	3. b)	4. b)	5.b)	6.b)	7.b)	8.b)	9.b)	10.b)	11.b)	12.b)	13.b)	14.b)	15.b)	16.b)
E02	7	7	7	7	5	7	7	7	7	7	7	8	7	7	7	7
E04	5	7	7	7	7	7	7	8	7	7	6	7	5	7	5	7
E10	5	5	5	7	7	5	7	5	7	5	5	5	6	6	6	5
E11	5	7	5	7	7	6	7	7	7	7	7	7	5	7	7	6
E14	6	5	5	6	5	6	7	6	6	6	7	5	5	7	7	5
E17	7	5	6	7	7	7	7	7	7	8	7	7	7	7	7	6
E21	5	6	7	7	7	6	7	5	7	7	5	7	5	7	6	5
E22	8	8	8	7	7	7	7	7	7	7	7	5	7	5	5	7
E24	3	5	5	7	5	7	3	5	7	3	7	5	5	5	7	5
E25	5	5	7	7	7	6	7	5	7	7	5	5	7	7	3	5
S12	7	7	7	5	7	7	7	5	7	6	6	5	5	7	3	5
S20	7	7	5	7	7	7	7	7	7	7	6	7	7	7	8	6
S23	5	7	5	5	5	5	6	7	7	7	5	5	5	5	7	7
S26	7	7	7		7	8	8	7	8	8	8	8	7	5	8	5
mean	5.9	6.3	6.1	6.6	6.4	6.5	6.7	6.3	7.0	6.6	6.3	6.1	5.9	6.4	6.1	5.8
Now-Should	-0.2	-0.4	-0.5	-0.6	-0.9	-0.9	-1.3	-1.7	-1.1	-1.6	-1.1	-1.4	-1.3	-0.9	-1.4	-1.1

## **Table 5 Footnotes:**

Profile of Organizational Characteristics (see questions in Attachment B)

- a) questions = How do you see your organization now?
- b) questions = How do you think your organization should be?

Summary of question topics:

### Leadership

- 1. confidence and trust
- 2. subordinates talk to superiors
- 3. ideas of subordinates sought

### Motivation

- 4. predominant form of motivation
- 5. responsibility for performance
- 6. cooperative teamwork

### Communication

- 7. direction of flow of information
- 8. communication received by lower levels
- 9. accurate upward communication
- 10. superiors understand problems of subordinates

### Decisions

- 11. levels decisions made
- 12. subordinates involved in decisions

### Goals

- 13. performance goals set
- 14. subordinates strive to achieve goals

### Controls

- 15. review and control functions
- 16. cost, productivity, and other reports used

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Now-Should = mean of each “now” questions minus mean of each “should” question.

**Table 6: POC -- Difference between high and low performing program in how the work unit is seen now.**

Now high	1. a)	2. a)	3. a)	4. a)	5.a)	6.a)	7.a)	8.a)	9.a)	10.a)	11.a)	12.a)	13.a)	14.a)	15.a)	16.a)
E02	5	5	6	5	2	6	5	5	6	5	4	6	5	6	3	4
E04	5	7	6	7	7	7	7	6	5	3	5	5	5	5	3	7
E10	5	5	5	7	7	5	5	5	5	5	4	4	6	6	5	5
E14	5	4	4	6	5	6	7	4	6	6	5	3	3	7	7	5
E17	7	4	3	7	6	6	3	3	6	1	2	2	7	7	7	5
S12	7	6	7	5	5	6	7	5	5	5	5	5	5	7	3	5
S23	4	5	4	4	3	3	3	3	5	7	5	3	1	2	3	3
Mean high	5.4	5.1	5.0	5.9	5.0	5.6	5.3	4.4	5.4	4.6	4.3	4.0	4.6	5.7	4.4	4.9
Now low	1. a)	2. a)	3. a)	4. a)	5.a)	6.a)	7.a)	8.a)	9.a)	10.a)	11.a)	12.a)	13.a)	14.a)	15.a)	16.a)
E11	5	6	6	6	5	4	4	5	5	4	5	5	3	5	4	4
E21	5	6	7	7	6	5	6	5	6	5	5	7	1	5	5	4
E22	8	8	8	7	5	5	3	5	5	5	7	5	7	5	5	3
E24	5	7	5	7	5	7	7	5	7	3	7	3	5	5	5	5
E25	4	5	6	3	7	5	7	4	7	6	5	5	5	5	3	5
S20	7	7	5	7	7	6	7	6	7	7	6	7	7	7	7	6
S26	7	7	7		7	7	5	3	7	7	7	7	5	5	7	5
Mean low	5.9	6.6	6.3	6.2	6.0	5.6	5.6	4.7	6.3	5.3	6.0	5.6	4.7	5.3	5.1	4.6
high-low	-0.4	-1.4	-1.3	-0.3	-1.0	0.0	-0.3	-0.3	-0.9	-0.7	-1.7	-1.6	-0.1	0.4	-0.7	0.3

**Table 6 Footnotes:**

Profile of Organizational Characteristics (see questions in Attachment B)

a) questions = How do you see your organization now?

**Summary of question topics**

Leadership

1. confidence and trust
2. subordinates talk to superiors
3. ideas of subordinates sought

Motivation

4. predominant form of motivation
5. responsibility for performance
6. cooperative teamwork

Communication

7. direction of flow of information
8. communication received by lower levels
9. accurate upward communication

10. superiors understand problems of subordinates

Decisions

11. levels decisions made

12. subordinates involved in decisions

Goals

13. performance goals set

14. subordinates strive to achieve goals

Controls

15. review and control functions

16. cost, productivity, and other reports used

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Now mean high = mean of a) question scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness.

Now mean low = mean of a) question scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

high-low = mean of a) question scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness minus mean of a) question scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

**Table 7: POC -- Difference between high and low performing program in how the work unit should be.**

Should high	1. b)	2. b)	3. b)	4. b)	5.b)	6.b)	7.b)	8.b)	9.b)	10.b)	11.b)	12.b)	13.b)	14.b)	15.b)	16.b)
E02	7	7	7	7	5	7	7	7	7	7	7	8	7	7	7	7
E04	5	7	7	7	7	7	7	8	7	7	6	7	5	7	5	7
E10	5	5	5	7	7	5	7	5	7	5	5	5	6	6	6	5
E14	6	5	5	6	5	6	7	6	6	6	7	5	5	7	7	5
E17	7	5	6	7	7	7	7	7	7	8	7	7	7	7	7	6
S12	7	7	7	5	7	7	7	5	7	6	6	5	5	7	3	5
S23	5	7	5	5	5	5	6	7	7	7	5	5	5	5	7	7
Mean high	6.0	6.1	6.0	6.3	6.1	6.3	6.9	6.4	6.9	6.6	6.1	6.0	5.7	6.6	6.0	6.0
Should low	1. b)	2. b)	3. b)	4. b)	5.b)	6.b)	7.b)	8.b)	9.b)	10.b)	11.b)	12.b)	13.b)	14.b)	15.b)	16.b)
E11	5	7	5	7	7	6	7	7	7	7	7	7	5	7	7	6
E21	5	6	7	7	7	6	7	5	7	7	5	7	5	7	6	5
E22	8	8	8	7	7	7	7	7	7	7	7	5	7	5	5	7
E24	3	5	5	7	5	7	3	5	7	3	7	5	5	5	7	5
E25	5	5	7	7	7	6	7	5	7	7	5	5	7	7	3	5
S20	7	7	5	7	7	7	7	7	7	7	6	7	7	7	8	6
S26	7	7	7		7	8	8	7	8	8	8	8	7	5	8	5
Mean low	5.7	6.4	6.3	7.0	6.7	6.7	6.6	6.1	7.1	6.6	6.4	6.3	6.1	6.1	6.3	5.6
hi-lo	0.3	-0.3	-0.3	-0.7	-0.6	-0.4	0.3	0.3	-0.3	0.0	-0.3	-0.3	-0.4	0.4	-0.3	0.4

**Table 7 Footnotes:**

Profile of Organizational Characteristics (see questions in Attachment B)

b) questions = How do you think your organization should be?

Summary of question topics

Leadership

1. confidence and trust
2. subordinates talk to superiors
3. ideas of subordinates sought

Motivation

4. predominant form of motivation
5. responsibility for performance
6. cooperative teamwork

Communication

7. direction of flow of information
8. communication received by lower levels
9. accurate upward communication
10. superiors understand problems of subordinates

### Decisions

11. levels decisions made
12. subordinates involved in decisions

### Goals

13. performance goals set
14. subordinates strive to achieve goals

### Controls

15. review and control functions
16. cost, productivity, and other reports used

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Now mean high = mean of b) question scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness.

Now mean low = mean of b) question scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

High-low = mean of b) question scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness minus mean of b) question scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

**Table 8: POC -- Difference between how ETC's and their supervisors perceive their work unit to be now.**

ETC Now	1. b)	2. b)	3. b)	4. b)	5. b)	6. b)	7. b)	8. b)	9. b)	10. b)	11. b)	12. b)	13. b)	14. b)	15. b)	16. b)
E02	5	5	6	5	2	6	5	5	6	5	4	6	5	6	3	4
E04	5	7	6	7	7	7	7	6	5	3	5	5	5	5	3	7
E10	5	5	5	7	7	5	5	5	5	5	4	4	6	6	5	5
E11	5	6	6	6	5	4	4	5	5	4	5	5	3	5	4	4
E14	5	4	4	6	5	6	7	4	6	6	5	3	3	7	7	5
E17	7	4	3	7	6	6	3	3	6	1	2	2	7	7	7	5
E21	5	6	7	7	6	5	6	5	6	5	5	7	1	5	5	4
E22	8	8	8	7	5	5	3	5	5	5	7	5	7	5	5	3
E24	5	7	5	7	5	7	7	5	7	3	7	3	5	5	5	5
E25	4	5	6	3	7	5	7	4	7	6	5	5	5	5	3	5
Mean ETC	5.4	5.7	5.6	6.2	5.5	5.6	5.4	4.7	5.8	4.3	4.9	4.5	4.7	5.6	4.7	4.7
Supv Now	1. b)	2. b)	3. b)	4. b)	5. b)	6. b)	7. b)	8. b)	9. b)	10. b)	11. b)	12. b)	13. b)	14. b)	15. b)	16. b)
S12	7	6	7	5	5	6	7	5	5	5	5	5	5	7	3	5
S20	7	7	5	7	7	6	7	6	7	7	6	7	7	7	7	6
S23	4	5	4	4	3	3	3	3	5	7	5	3	1	2	3	3
S26	7	7	7		7	7	5	3	7	7	7	7	5	5	7	5
Mean Supv	6.3	6.3	5.8	5.3	5.5	5.5	5.5	4.3	6.0	6.5	5.8	5.5	4.5	5.3	5.0	4.8
ETC-Supv	-0.9	-0.6	-0.2	0.9	0.0	0.1	-0.1	0.5	-0.2	-2.2	-0.9	-1.0	0.2	0.4	-0.3	0.0

**Table 8 Footnotes:**

Profile of Organizational Characteristics (see questions in Attachment B)

a) questions = How do you see your organization now?

Summary of question topics:

Leadership

1. confidence and trust
2. subordinates talk to superiors
3. ideas of subordinates sought

Motivation

4. predominant form of motivation
5. responsibility for performance
6. cooperative teamwork

Communication

7. direction of flow of information
8. communication received by lower levels
9. accurate upward communication
10. superiors understand problems of subordinates

Decisions

- 11. levels decisions made
- 12. subordinates involved in decisions

Goals

- 13. performance goals set
- 14. subordinates strive to achieve goals

Controls

- 15. review and control functions
- 16. cost, productivity, and other reports used

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

ETC Now = mean of a) question scores of ETCs.

Supv Now = mean of a) question scores supervisors of ETCs.

ETC-Supv = mean of a) question scores of ETCs minus mean of a) question scores of supervisors of ETCs.

**Table 9: POC -- Difference between how ETC's and their supervisors think their work unit should be.**

ETC Should	1. b)	2. b)	3. b)	4. b)	5. b)	6. b)	7. b)	8. b)	9. b)	10. b)	11. b)	12. b)	13. b)	14. b)	15. b)	16. b)
E02	3	5	5	7	5	7	3	5	7	3	7	5	5	5	7	5
E04	5	7	5	7	7	6	7	7	7	7	7	7	5	7	7	6
E10	5	5	7	7	7	6	7	5	7	7	5	5	7	7	3	5
E11	5	7	7	7	7	7	7	8	7	7	6	7	5	7	5	7
E14	5	6	7	7	7	6	7	5	7	7	5	7	5	7	6	5
E17	8	8	8	7	7	7	7	7	7	7	7	5	7	5	5	7
E21	6	5	5	6	5	6	7	6	6	6	7	5	5	7	7	5
E22	7	5	6	7	7	7	7	7	7	8	7	7	7	7	7	6
E24	7	7	7	7	5	7	7	7	7	7	7	8	7	7	7	7
E25	5	5	5	7	7	5	7	5	7	5	5	5	6	6	6	5
Mean ETC	5.6	6.0	6.2	6.9	6.4	6.4	6.6	6.2	6.9	6.4	6.3	6.1	5.9	6.5	6.0	5.8
Supv. Should	1. b)	2. b)	3. b)	4. b)	5. b)	6. b)	7. b)	8. b)	9. b)	10. b)	11. b)	12. b)	13. b)	14. b)	15. b)	16. b)
S12	7	7	7	5	7	7	7	5	7	6	6	5	5	7	3	5
S20	7	7	5	7	7	7	7	7	7	7	6	7	7	7	8	6
S23	5	7	5	5	5	5	6	7	7	7	5	5	5	5	7	7
S26	7	7	7		7	8	8	7	8	8	8	8	7	5	8	5
Mean Supv.	6.5	7.0	6.0	5.7	6.5	6.8	7.0	6.5	7.3	7.0	6.3	6.3	6.0	6.0	6.5	5.8
ETC-Supv.	-0.9	-1.0	0.2	1.2	-0.1	-0.4	-0.4	-0.3	-0.4	-0.6	0.0	-0.2	-0.1	0.5	-0.5	0.0

## **Table 9 Footnotes:**

Profile of Organizational Characteristics (see questions in Attachment B)

b) questions = How do you think your organization should be?

Summary of question topics

### Leadership

1. confidence and trust
2. subordinates talk to superiors
3. ideas of subordinates sought

### Motivation

4. predominant form of motivation
5. responsibility for performance
6. cooperative teamwork

### Communication

7. direction of flow of information
8. communication received by lower levels
9. accurate upward communication
10. superiors understand problems of subordinates

### Decisions

11. levels decisions made
12. subordinates involved in decisions

### Goals

13. performance goals set
14. subordinates strive to achieve goals

### Controls

15. review and control functions
16. cost, productivity, and other reports used

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as, mode, median, or geometric mean.

ETC Should = mean of b) question scores of ETCs.

Supv Should = mean of b) question scores supervisors of ETCs.

ETC-Supv = mean of b) question scores of ETCs minus mean of b) question scores of supervisors of ETCs.

**Table 10: Overview of responses to demographic questions**

Client Code	Age Range	Coll. Level	Educ. area	Work Exp.	Yrs. in org	Yrs. as ETC	Organizational Function	Question Numbers						
								8	9	10	11	12	13	14
E02	2	C	1	17	17	2.5	Operations	1	1	1	1	1	1	2
E04	3	C	1	16	10	10	Exec Asst	2	2	2	2	2	2	2
E10	4	M	2	35	5	3	Cust Svs	2	2	2	2	2	2	2
E11	2	B	3	4	4	3	Health & Saf	1	2	2	2	2	2	2
E14	2	C	1	15	4	2	Human Resc.	2	2	2	2	2	2	2
E17	2	B	1	8	2	1.5	Human Resc.	3	3	3	4	4	2	1
E21	4	M	1	30	7	7	Facilities	1	1	2	1	2	2	2
E22	3	M	1	22	7	3	Consulting	2	2	2	3	1	2	3
E24	4	C	4	30	11	2.5	Acct/Finance	2	1	2	2	2	2	2
E25	3	B	4	23	5	2.4	Quality	2	2	2	2	2	2	1
S12	3	B	1	20	20	6	Administration	1	1	2	1	2	2	2
S20	5	B	1	31	9	3	Operations	1	2	2	2	3	2	2
S23	5	M	6	37	27	2.4	Operations	1	1	1	1	1	1	1
S26	5	M	3	30	12	10	Pur./Warehse.	2	1	2	2	2	2	2

Responses to questions 8 - 14: 1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree

- 8. The Employee Transportation Program at this location satisfies the intent of the program.
- 9. Local managers support this program in a way that contributes to its success.
- 10. It is clear that top managers believe this program is important.
- 11. There is adequate funding for the success of this program.
- 12. Employees consider the purpose of this program to be important.
- 13. Local managers and supervisors consider this program to be important.
- 14. My other work priorities are such that I have an appropriate amount of time for this program.

**Table 10 Footnotes:**

Profile of Organizational Characteristics (see questions in Attachment A)

Age Range:

- 1 = under 25
- 2 = 26–35
- 3 = 36–45
- 4 = 46–55
- 5 = over 55

College Level:  
 N = No college  
 C = Some college with no degree, or 2-year degree  
 B = Bachelor-level degree (four year)  
 M = Master-level degree or above

Educ. Area  
 1 = Business/Economics  
 2 = Education/History/Social Science  
 3 = Engineering  
 4 = General Education  
 6 = Political Science/Law

Work Experience (stated in years)

Yrs. in org = Number of years experience in the organization

Yrs. as ETC = Number of years experience as an ETC or supervisor of ETC.

**Table 11: Overview of CVAT Part 1 Responses on Personal Values (PC) (n=14)**

PV	Work				Relations				Control				Thought				s.d. PV
	As	Bs	Cs	Ds	Es	Fs	Gs	Hs	Is	Js	Ks	Ls	Ms	Ns	Os	Ps	
E02	20	17	11	19	10	14	13	16	13	15	7	9	8	11	10	7	3.95
E04	12	13	10	15	19	17	14	20	12	10	6	12	5	17	10	8	4.23
E10	17	16	11	13	11	16	15	15	14	9	6	10	12	9	16	10	3.12
E11	13	15	11	17	18	17	9	16	10	16	5	8	18	11	8	8	4.12
S12	14	11	15	18	13	15	10	19	11	10	10	7	10	17	12	8	3.43
E14	16	17	9	11	14	17	14	20	12	9	6	9	7	14	16	9	3.97
E17	8	10	8	14	17	13	11	12	15	14	8	11	15	15	13	16	2.83
S20	15	17	13	17	8	16	10	16	11	6	6	18	10	15	13	9	3.87
E21	17	17	14	20	10	14	10	13	13	13	6	10	14	14	7	8	3.69
E22	13	11	6	11	14	16	14	15	14	8	8	16	16	11	14	13	2.98
S23	11	18	11	19	12	8	8	16	11	10	10	12	13	14	13	14	3.06
E24	18	16	16	17	14	13	12	20	12	11	6	11	7	11	9	7	4.00
E25	15	12	13	17	6	18	8	17	10	9	10	11	12	14	18	10	3.59
S26	15	10	17	16	6	8	8	9	13	9	10	20	14	16	15	14	3.86
Mean	14.6	14.3	11.8	16.0	12.3	14.4	11.1	16.0	12.2	10.6	7.4	11.7	11.5	13.5	12.4	10.1	
Sum				56.6				53.9				42.0				47.5	

**Table 11 Footnotes:**

CVAT = Culture and Values Analysis Tool

PV = Personal Values

See Attachment C for description of dimensions

## WORK

As = Effort as a value for self

Bs = Time as a value for self

Cs = Finish Job as a value for self

Ds = Quality as a value for self

## RELATIONS

Es = Affect as a value for self

Fs = Empathy as a value for self

Gs = Sociability as a value for self

Hs = Loyalty as a value for self

## CONTROL

Is = Dominance as a value for self

Js = Status as a value for self

Ks = Political as a value for self

Ls = Leader as a value for self

## THOUGHT

Ms = Abstract as a value for self

Ns = Plan/Organize as a value for self

Os = Exposition as a value for self

Ps = Flexibility as a value for self

s.d. PV = standard deviation of Personal Values. The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data. A lower s.d. implies that the participant has a consistent perception of expressed values and does not elevate a particular value over another. A higher s.d. implies that the participant has a more marked opinion of particular values and can more easily express the importance of one value over another.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Sum = the sum of the means for each set of four Personal Values dimensions that compose a Values category.

**Table 12: Overview of CVAT Part 2 Responses on Work Unit Culture (UC) (n=14)**

UC	Work				Relations				Control				Thought				s.d. UC
	Au	Bu	Cu	Du	Eu	Fu	Gu	Hu	Iu	Ju	Ku	Lu	Mu	Nu	Ou	Pu	
E02	19	12	12	19	11	10	7	11	13	7	8	15	13	16	12	15	3.55
E04	15	9	13	20	12	11	15	10	8	17	9	18	5	12	14	12	3.81
E11	18	9	16	19	11	13	12	14	9	9	10	15	16	8	7	14	3.57
S12	14	10	8	18	14	18	8	18	13	13	9	11	14	12	9	11	3.30
E14	12	14	15	14	9	14	16	9	13	15	19	15	11	9	6	9	3.30
E15	14	8	10	12	6	8	14	9	10	15	20	19	17	12	17	9	4.11
E17	17	9	13	15	18	19	19	14	13	11	6	11	7	9	11	8	4.09
S20	15	10	10	16	11	11	11	7	13	9	7	20	11	16	16	17	3.66
E21	13	9	10	18	13	20	14	9	10	8	8	13	16	15	10	14	3.48
E22	14	13	11	19	7	12	7	6	11	16	19	15	14	11	14	11	3.72
S23	15	11	9	16	5	6	7	10	15	15	19	20	14	17	13	8	4.49
E24	17	10	8	17	14	17	11	16	9	13	7	16	12	13	9	11	3.30
E25	18	16	11	19	7	9	12	8	11	11	8	17	14	11	13	15	3.59
S26	17	12	10	17	8	11	12	8	13	12	9	20	12	12	15	12	3.22
Mean	15.6	10.9	11.1	17.1	10.4	12.8	11.8	10.6	11.5	12.2	11.3	16.1	12.6	12.4	11.9	11.9	
Sum	54.6				45.6				51.1				48.6				
<b>All</b>	<b>Au</b>	<b>Bu</b>	<b>Cu</b>	<b>Du</b>	<b>Eu</b>	<b>Fu</b>	<b>Gu</b>	<b>Hu</b>	<b>Iu</b>	<b>Ju</b>	<b>Ku</b>	<b>Lu</b>	<b>Mu</b>	<b>Nu</b>	<b>Ou</b>	<b>Pu</b>	
PV-UC	-1.0	3.4	0.6	-1.1	1.9	1.6	-0.6	5.4	0.7	-1.6	-3.9	-4.4	-1.1	1.1	0.6	-1.8	

**Table 12 Footnotes:**

UC = Unit Culture

See Attachment C for description of dimensions

WORK

Au = Effort as rewarded in the work unit

Bu = Time as rewarded in the work unit

Cu = Finish Job as rewarded in the work unit

Du = Quality as rewarded in the work unit

RELATIONS

Eu = Affect as rewarded in the work unit

Fu = Empathy as rewarded in the work unit

Gu = Sociability as rewarded in the work unit

Hu = Loyalty as rewarded in the work unit

## CONTROL

Iu = Dominance as rewarded in the work unit

Ju = Status as rewarded in the work unit

Ku = Political as rewarded in the work unit

Lu = Leader as rewarded in the work unit

## THOUGHT

Mu = Abstract as rewarded in the work unit

Nu = Plan/Organize as rewarded in the work unit

Ou = Exposition as rewarded in the work unit

Pu = Flexibility as rewarded in the work unit

s.d. UC = standard deviation of Unit Culture. The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data. A lower s.d. implies that the participant has a consistent perception of expressed rewards and does not perceive a particular reward over another. A higher s.d. implies that the participant has a more marked opinion of what is rewarded and can more easily express the perception that one form of reward has more value in the work place than another.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Sum = the sum of the means for each set of four Unit Culture dimensions that compose a Culture category.

PV-UC = mean Personal Value minus mean Unit Culture

**Table 13: CVAT -- Difference between ETC and Supervisor perception of personal values.**

PV-E	Work				Relations				Control				Thought				s.d. PV
	As	Bs	Cs	Ds	Es	Fs	Gs	Hs	Is	Js	Ks	Ls	Ms	Ns	Os	Ps	
E02	20	17	11	19	10	14	13	16	13	15	7	9	8	11	10	7	3.95
E04	12	13	10	15	19	17	14	20	12	10	6	12	5	17	10	8	4.23
E10	17	16	11	13	11	16	15	15	14	9	6	10	12	9	16	10	3.12
E11	13	15	11	17	18	17	9	16	10	16	5	8	18	11	8	8	4.12
E14	16	17	9	11	14	17	14	20	12	9	6	9	7	14	16	9	3.97
E17	8	10	8	14	17	13	11	12	15	14	8	11	15	15	13	16	2.83
E21	17	17	14	20	10	14	10	13	13	13	6	10	14	14	7	8	3.69
E22	13	11	6	11	14	16	14	15	14	8	8	16	16	11	14	13	2.98
E24	18	16	16	17	14	13	12	20	12	11	6	11	7	11	9	7	4.00
E25	15	12	13	17	6	18	8	17	10	9	10	11	12	14	18	10	3.59
Mean	15	14	11	15	13	16	12	16	13	11	6.8	11	11	13	12	9.6	
Sum				56				57				41				46	
PV-S	As	Bs	Cs	Ds	Es	Fs	Gs	Hs	Is	Js	Ks	Ls	Ms	Ns	Os	Ps	s.d. PV
S12	14	11	15	18	13	15	10	19	11	10	10	7	10	17	12	8	3.43
S20	15	17	13	17	8	16	10	16	11	6	6	18	10	15	13	9	3.87
S23	11	18	11	19	12	8	8	16	11	10	10	12	13	14	13	14	3.06
S26	15	10	17	16	6	8	8	9	13	9	10	20	14	16	15	14	3.86
Mean	13.8	14.0	14.0	17.5	9.8	11.8	9.0	15.0	11.5	8.8	9.0	14.3	11.8	15.5	13.3	11.3	
Sum				59.3				45.5				43.5				51.8	
PV	As	Bs	Cs	Ds	Es	Fs	Gs	Hs	Is	Js	Ks	Ls	Ms	Ns	Os	Ps	
E-S	1.2	0.4	-3.1	-2.1	3.6	3.8	3.0	1.4	1.0	2.7	-2.2	-3.6	-0.4	-2.8	-1.2	-1.7	

**Table 13 Footnotes:**

CVAT = Culture and Values Analysis Tool

PV-E = Personal Values of ETCs

PV-S = Personal Values of Supervisors of ETCs

See Attachment C for description of dimensions

**WORK**

As = Effort as a value for self

Bs = Time as a value for self

Cs = Finish Job as a value for self

Ds = Quality as a value for self

## RELATIONS

Es = Affect as a value for self  
Fs = Empathy as a value for self  
Gs = Sociability as a value for self  
Hs = Loyalty as a value for self

## CONTROL

Is = Dominance as a value for self  
Js = Status as a value for self  
Ks = Political as a value for self  
Ls = Leader as a value for self

## THOUGHT

Ms = Abstract as a value for self  
Ns = Plan/Organize as a value for self  
Os = Exposition as a value for self  
Ps = Flexibility as a value for self

s.d. PV = standard deviation of Personal Values. The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data. A lower s.d. implies that the participant has a consistent perception of expressed values and does not elevate a particular value over another. A higher s.d. implies that the participant has a more marked opinion of particular values and can more easily express the importance of one value over another.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Sum = the sum of the means for each set of four Personal Values dimensions that compose a Values category.

PV E-S = the mean of Personal Values of ETCs minus the mean of Personal Values of Supervisors of ETCs.

**Table 14: CVAT -- Difference between ETC and Supervisor perception of work unit culture.**

UC-E	Work				Relations				Control				Thought				s.d. UC
	Au	Bu	Cu	Du	Eu	Fu	Gu	Hu	Iu	Ju	Ku	Lu	Mu	Nu	Ou	Pu	
E02	19	12	12	19	11	10	7	11	13	7	8	15	13	16	12	15	3.55
E04	15	9	13	20	12	11	15	10	8	17	9	18	5	12	14	12	3.81
E11	18	9	16	19	11	13	12	14	9	9	10	15	16	8	7	14	3.57
E14	12	14	15	14	9	14	16	9	13	15	19	15	11	9	6	9	3.30
E15	14	8	10	12	6	8	14	9	10	15	20	19	17	12	17	9	4.11
E17	17	9	13	15	18	19	19	14	13	11	6	11	7	9	11	8	4.09
E21	13	9	10	18	13	20	14	9	10	8	8	13	16	15	10	14	3.48
E22	14	13	11	19	7	12	7	6	11	16	19	15	14	11	14	11	3.72
E24	17	10	8	17	14	17	11	16	9	13	7	16	12	13	9	11	3.30
E25	18	16	11	19	7	9	12	8	11	11	8	17	14	11	13	15	3.59
Mean	16	11	12	17	11	13	13	11	11	12	11	15	13	12	11	12	
Sum	55.7				47.4				49.7				47.2				
UC-S	Au	Bu	Cu	Du	Eu	Fu	Gu	Hu	Iu	Ju	Ku	Lu	Mu	Nu	Ou	Pu	s.d. UC
S12	14	10	8	18	14	18	8	18	13	13	9	11	14	12	9	11	3.30
S20	15	10	10	16	11	11	11	7	13	9	7	20	11	16	16	17	3.66
S23	15	11	9	16	5	6	7	10	15	15	19	20	14	17	13	8	4.49
S26	17	12	10	17	8	11	12	8	13	12	9	20	12	12	15	12	3.22
Mean	15.3	10.8	9.3	16.8	9.5	11.5	9.5	10.8	13.5	12.3	11.0	17.8	12.8	14.3	13.3	12.0	
Sum	52.0				41.3				54.5				52.3				
UC	Au	Bu	Cu	Du	Eu	Fu	Gu	Hu	Iu	Ju	Ku	Lu	Mu	Nu	Ou	Pu	
E-S	0.4	0.2	2.7	0.4	1.3	1.8	3.2	-0.2	-2.8	-0.1	0.4	-2.4	-0.3	-2.7	-2.0	-0.2	

**Table 14 Footnotes:**

CVAT = Culture and Values Analysis Tool  
 UC-E = perception of Unit Culture of ETCs  
 UC-S = perception of Unit Culture of Supervisors of ETCs  
 See Attachment C for description of dimensions

**WORK**

Au = Effort as rewarded in the work unit  
 Bu = Time as rewarded in the work unit  
 Cu = Finish Job as rewarded in the work unit  
 Du = Quality as rewarded in the work unit

## RELATIONS

Eu = Affect as rewarded in the work unit  
Fu = Empathy as rewarded in the work unit  
Gu = Sociability as rewarded in the work unit  
Hu = Loyalty as rewarded in the work unit

## CONTROL

Iu = Dominance as rewarded in the work unit  
Ju = Status as rewarded in the work unit  
Ku = Political as rewarded in the work unit  
Lu = Leader as rewarded in the work unit

## THOUGHT

Mu = Abstract as rewarded in the work unit  
Nu = Plan/Organize as rewarded in the work unit  
Ou = Exposition as rewarded in the work unit  
Pu = Flexibility as rewarded in the work unit

s.d. UC = standard deviation of Unit Culture.

The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data. A lower s.d. implies that the participant has a consistent perception of expressed rewards and does not perceive a particular reward over another. A higher s.d. implies that the participant has a more marked opinion of what is rewarded and can more easily express the perception that one form of reward has more value in the work place than another.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Sum = the sum of the means for each set of four Unit Culture dimensions that compose a Culture category.

UC E-S = the mean of perceived Unit Culture of ETCs minus the mean of perceived Unit Culture of Supervisors of ETCs.

**Table 15: CVAT -- Difference in perception of personal values between high and low performing programs.**

	Work				Relations				Control				Thought				
PV-hi	As	Bs	Cs	Ds	Es	Fs	Gs	Hs	Is	Js	Ks	Ls	Ms	Ns	Os	Ps	s.d. PV
2	14	11	15	18	13	15	10	19	11	10	10	7	10	17	12	8	3.43
2	8	10	8	14	17	13	11	12	15	14	8	11	15	15	13	16	2.83
3	16	17	9	11	14	17	14	20	12	9	6	9	7	14	16	9	3.97
5	12	13	10	15	19	17	14	20	12	10	6	12	5	17	10	8	4.23
7	20	17	11	19	10	14	13	16	13	15	7	9	8	11	10	7	3.95
7	11	18	11	19	12	8	8	16	11	10	10	12	13	14	13	14	3.06
8	17	16	11	13	11	16	15	15	14	9	6	10	12	9	16	10	3.12
Mean	14	15	11	16	14	14	12	17	13	11	7.6	10	10	14	13	10	
Sum	54.9				57.0				41.1				47.0				
PV-lo	As	Bs	Cs	Ds	Es	Fs	Gs	Hs	Is	Js	Ks	Ls	Ms	Ns	Os	Ps	s.d. PV
9	13	11	6	11	14	16	14	15	14	8	8	16	16	11	14	13	2.98
10	17	17	14	20	10	14	10	13	13	13	6	10	14	14	7	8	3.69
10	15	10	17	16	6	8	8	9	13	9	10	20	14	16	15	14	3.86
11	13	15	11	17	18	17	9	16	10	16	5	8	18	11	8	8	4.12
12	15	17	13	17	8	16	10	16	11	6	6	18	10	15	13	9	3.87
12	18	16	16	17	14	13	12	20	12	11	6	11	7	11	9	7	4.00
13	15	12	13	17	6	18	8	17	10	9	10	11	12	14	18	10	3.59
Mean	15.1	14.0	12.9	16.4	10.9	14.6	10.1	15.1	11.9	10.3	7.3	13.4	13.0	13.1	12.0	9.9	
Sum	58.4				50.7				42.9				48.0				
PV	As	Bs	Cs	Ds	Es	Fs	Gs	Hs	Is	Js	Ks	Ls	Ms	Ns	Os	Ps	
hi-lo	-1.1	0.6	-2.1	-0.9	2.9	-0.3	2.0	1.7	0.7	0.7	0.3	-3.4	-3.0	0.7	0.9	0.4	

**Table 15 Footnotes:**

CVAT = Culture and Values Analysis Tool

PV-hi = Personal Value scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness.

PV-lo = Personal Value scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

See Attachment C for description of dimensions

## WORK

As = Effort as a value for self

Bs = Time as a value for self

Cs = Finish Job as a value for self

Ds = Quality as a value for self

## RELATIONS

Es = Affect as a value for self

Fs = Empathy as a value for self

Gs = Sociability as a value for self

Hs = Loyalty as a value for self

## CONTROL

Is = Dominance as a value for self

Js = Status as a value for self

Ks = Political as a value for self

Ls = Leader as a value for self

## THOUGHT

Ms = Abstract as a value for self

Ns = Plan/Organize as a value for self

Os = Exposition as a value for self

Ps = Flexibility as a value for self

s.d. PV = standard deviation of Personal Values. The square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data. A lower s.d. implies that the participant has a consistent perception of expressed values and does not elevate a particular value over another. A higher s.d. implies that the participant has a more marked opinion of particular values and can more easily express the importance of one value over another.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Sum = the sum of the means for each set of four Personal Values dimensions that compose a Values category.

PV hi-lo = mean of Personal Value scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness minus mean of Personal Value scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

**Table 16: CVAT -- Difference in perception of work unit culture between high and low performing programs.**

UC-hi	Work				Relations				Control				Thought				s.d. UC
	Au	Bu	Cu	Du	Eu	Fu	Gu	Hu	Iu	Ju	Ku	Lu	Mu	Nu	Ou	Pu	
2	14	10	8	18	14	18	8	18	13	13	9	11	14	12	9	11	3.30
2	17	9	13	15	18	19	19	14	13	11	6	11	7	9	11	8	4.09
3	12	14	15	14	9	14	16	9	13	15	19	15	11	9	6	9	3.30
5	15	9	13	20	12	11	15	10	8	17	9	18	5	12	14	12	3.81
6	14	8	10	12	6	8	14	9	10	15	20	19	17	12	17	9	4.11
7	19	12	12	19	11	10	7	11	13	7	8	15	13	16	12	15	3.55
7	15	11	9	16	5	6	7	10	15	15	19	20	14	17	13	8	4.49
Mean	15	10	11	16	11	12	12	12	12	13	13	16	12	12	12	10	
Sum	53.3				46.9				53.9				46.0				
UC-lo	Au	Bu	Cu	Du	Eu	Fu	Gu	Hu	Iu	Ju	Ku	Lu	Mu	Nu	Ou	Pu	s.d. UC
9	14	13	11	19	7	12	7	6	11	16	19	15	14	11	14	11	3.72
10	13	9	10	18	13	20	14	9	10	8	8	13	16	15	10	14	3.48
10	17	12	10	17	8	11	12	8	13	12	9	20	12	12	15	12	3.22
11	18	9	16	19	11	13	12	14	9	9	10	15	16	8	7	14	3.57
12	15	10	10	16	11	11	11	7	13	9	7	20	11	16	16	17	3.66
12	17	10	8	17	14	17	11	16	9	13	7	16	12	13	9	11	3.30
13	18	16	11	19	7	9	12	8	11	11	8	17	14	11	13	15	3.59
Mean	16.0	11.3	10.9	17.9	10.1	13.3	11.3	9.7	10.9	11.1	9.7	16.6	13.6	12.3	12.0	13.4	
Sum	56.0				44.4				48.3				51.3				
UC	Au	Bu	Cu	Du	Eu	Fu	Gu	Hu	Iu	Ju	Ku	Lu	Mu	Nu	Ou	Pu	
hi-lo	-0.9	-0.9	0.6	-1.6	0.6	-1.0	1.0	1.9	1.3	2.1	3.1	-1.0	-2.0	0.1	-0.3	-3.1	

**Table 16 Footnotes:**

CVAT = Culture and Values Analysis Tool

UC-hi = perception of Unit Culture scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness.

UC-lo = perception of Unit Culture scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

See Attachment C for description of dimensions

## WORK

Au = Effort as rewarded in the work unit  
Bu = Time as rewarded in the work unit  
Cu = Finish Job as rewarded in the work unit  
Du = Quality as rewarded in the work unit

## RELATIONS

Eu = Affect as rewarded in the work unit  
Fu = Empathy as rewarded in the work unit  
Gu = Sociability as rewarded in the work unit  
Hu = Loyalty as rewarded in the work unit

## CONTROL

Iu = Dominance as rewarded in the work unit  
Ju = Status as rewarded in the work unit  
Ku = Political as rewarded in the work unit  
Lu = Leader as rewarded in the work unit

## THOUGHT

Mu = Abstract as rewarded in the work unit  
Nu = Plan/Organize as rewarded in the work unit  
Ou = Exposition as rewarded in the work unit  
Pu = Flexibility as rewarded in the work unit

s.d. UC = standard deviation of Unit Culture: the square root of the mean of the sum of squared variances from mean. Used as a measure of dispersion that refers to the variability or spread in the data. A lower s.d. implies that the participant has a consistent perception of expressed rewards and does not perceive a particular reward over another. A higher s.d. implies that the participant has a more marked opinion of what is rewarded and can more easily express the perception that one form of reward has more value in the work place than another.

Mean: arithmetic mean is the sum of a set of measurements divided by the number of measurements in the set. For this study, arithmetic mean provides a better measure of central location to estimate a population parameter than other expressions of average, such as mode, median, or geometric mean.

Sum = the sum of the means for each set of four Unit Culture dimensions that compose a Culture category.

UC hi-lo = mean perceived Unit Culture scores of ETCs and supervisors from first seven organizations from a list of participating organizations ranked by transportation program effectiveness minus mean of perceived Unit Culture scores of ETCs and supervisors from last seven organizations from a list of participating organizations ranked by transportation program effectiveness.

**Table 17: Chart III from DiSC -- the official report**

Code ETC Respondents	Rank	Segment Numbers from Graph III				Pattern Name	Intensity Number from Graph III			
		D	i	S	C		D	i	S	C
E02	7	2	5	3	7	Appraiser	7	17	12	25
E04	5	6	5	5	1	Result-Oriented	21	17	20	2
E08	1	3	5	3	6	Appraiser	12	19	10	22
E09	4	4	4	3	5	Objective Thinker	16	14	10	19
E10	8	2	6	5	4	Counselor	7	21	20	14
E11	11	1	2	7	6	Perfectionist	2	8	27	22
E14	3	4	7	4	2	Promoter	14	27	15	5
E15	6	2	1	7	6	Perfectionist	8	2	27	23
E17	2	1	7	7	5	Practitioner	2	23	25	17
E21	10	5	1	6	4	Achiever	20	3	23	14
E22	5	3	2	6	5	Perfectionist	11	8	21	18
E24	12	5	2	5	5	Investigator	18	5	20	18
E25	13	3	6	5	2	Counselor	11	23	20	8
<b>Supervisor Respondents</b>										
S05	11	3	6	4	5	Practitioner	9	21	14	17
S12	2	3	4	5	4	Specialist	11	14	20	16
S20	12	5	5	3	3	Inspirational	18	17	12	11
S23	7	6	7	2	1	Inspirational	21	27	6	3
S26	10	7	2	1	5	Creative	27	5	2	18

**Table 17 Footnotes:**

Rank indicates the highest performing organizations (1) to the lowest (13) in the study.

Pattern name is one of the 13 classical profile patterns established by the DiSC researchers.

Most persons have only one or two behavioral traits at or above the midline, and these can be viewed in combination to interpret the greatest needs-driven behaviors of an individual, including Directing, Influencing, Steadiness and Conscientiousness. The number of respondents to this study was not such that any conclusions can be drawn from the Classical profile pattern.

**Table 18: Chart I and II from DiSC -- anecdotal observations**

Chart I: projected behaviors

Segment Numbers from Graph I Most (Intermediate)				Pattern
D	i	S	C	
3	4	3	7	Objective Thinker
4	5	6	2	Agent
3	6	3	6	Appraiser
4	5	3	5	Appraiser
2	6	6	4	Counselor
2	2	7	4	Specialist
3	7	5	2	Counselor
2	3	7	4	Specialist
1	6	7	4	Agent
5	3	6	4	Achiever
3	3	5	6	Perfectionist
6	1	5	5	Investigator
3	6	6	2	Counselor
3	6	5	4	Counselor
3	4	5	6	Perfectionist
5	4	5	3	Achiever
4	7	3	1	Promoter
7	1	2	6	Creative

Chart II: response under pressure

Segment Numbers from Graph II Least (Intermediate)				Pattern
D	i	S	C	
1	6	4	6	Practitioner
6	4	5	1	Achiever
3	4	3	5	Objective Thinker
4	3	3	6	Objective Thinker
2	6	5	4	Counselor
1	3	7	7	Perfectionist
5	5	4	2	Inspirational
3	1	7	7	Perfectionist
1	7	7	6	Practitioner
6	1	7	4	Achiever
3	3	7	4	Specialist
3	3	6	5	Perfectionist
3	6	4	3	Promoter
2	6	3	6	Appraiser
3	3	7	3	Specialist
5	5	2	4	Inspirational
6	6	2	1	Inspirational
7	3	1	4	Developer

**Table 18 Footnotes:**

As explained previously, long-term users of this instrument have found very strong anecdotal evidence that the Chart I, where respondents indicate how they are “Most” within a given job focus correspond most highly to the way people intend to project their behaviors. In this case, they were given the specific focus of “my job as an ETC” or “supervising my ETC.” Similarly, the creator of the instrument found that Chart II, wherein respondents indicate how they are “Least” within the same focus, is often more closely aligned with the instinctive response to pressure. Only Chart III results have been validated and reliability tested, as explained in the section concerning validity and reliability of instruments (see Table 17). However, the insight provided by how people project their behavior MOST (Graph1) and LEAST (Graph II) lend insight in a small sample size such as this.