Minnesota Summit on Civil Engineering Work Force Development
Minnesota Summit on Civil Engineering Workforce Development

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This report represents the results of research conducted by the authors and does not necessarily represent the views or policy of the Minnesota Department of Transportation. This report does not contain a standard or specified technique.
The situation of growing demand, and level or dwindling supply for civil engineering positions poses a significant challenge for Minnesota and for the country at large. To avoid turning the pending reality into a major crisis, though, Minnesota decided to take action. The Research Implementation Committee (RIC) of Minnesota’s Local Road Research Board (LRRB) sponsored the Minnesota Summit on Civil Engineering Workforce Development to address civil engineering employment issues.

Held Aug. 9, 2000, the summit attracted 44 leaders from the private and public sector, including representatives from city and county government, the Minnesota Department of Transportation, federal government, private engineering firms, industry organizations, and educational institutions. Summit participants focused on the following tasks:

- Reviewing recent research on the expected demand and supply of civil engineers, surveyors, and technicians.
- Showcasing innovative methods of recruiting and retaining civil engineers, surveyors, and technicians by reviewing nationwide best practices.
- Examining the survey of cities, counties, and industry that assessed the nature of the problem in Minnesota.
- Developing an action plan that collaboratively leverages the resources of all the workforce development stakeholders.
- Defining roles and responsibilities for solving the program among all stakeholders.

Divided into four smaller groups, participants completed problem and vision statements for four key areas: awareness, attraction, access; recruiting, retention redesign; and re-recruiting. The report details work completed at the summit and the actions that resulted from the summit.
ACKNOWLEDGMENTS

The Local Road Research Board provided funding for this summit, and a Technical Advisory Panel provided direction and guidance for the project. We appreciate the assistance of the following people who served on the Technical Advisory Panel:

Dick Hansen, Chair, Director of Public Works, St. Louis County
Wayne Brede, Office of Human Resources, Minnesota Department of Transportation
John Gulliver, Professor and Chair, Department of Civil Engineering, University of Minnesota
Ann Johnson, Dunwoody Institute
Dave Johnson, Assistant Director, Office of Research Services, Mn/DOT
Bill Lohr, Pavement & Materials Engineer, Federal Highway Administration
Mark Maloney, Director of Public Works, City of Shoreview
Dave Oxley, Executive Director, Consulting Engineers Council of Minnesota
Micky Ruiz, Technology Transfer Manager, Mn/DOT
Lou Tasa, District State Aid Engineer, Mn/DOT
Cheri Trenda, Technology Transfer/LTAP Center Program Director, Center for Transportation Studies, University of Minnesota
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Executive Summary

The Minnesota Workforce Center estimates an anticipated growth rate of 28 percent for civil engineering positions in the state, translating into an estimated 140 openings per year through the year 2008.

Sound like good news? It might be, except for the projections that show virtually no growth in the number of undergraduate degrees granted in civil engineering.

And the picture isn't better for civil engineering technicians. With a declining enrollment in civil engineering and related fields in Minnesota technical colleges and anticipated minimum growth rate of nearly 10 percent in technician related positions, there is again a growing critical gap between demand and supply.

The situation of growing demand, and level or dwindling supply poses a significant challenge for Minnesota and for the country at large. At a time when the most experienced civil engineers and technicians are retiring, the need for qualified professionals continues to rise without relief in immediate sight.

To avoid turning the pending reality into a major crisis, though, Minnesota decided to take action. The Research Implementation Committee (RIC) of Minnesota’s Local Road Research Board (LRRB) sponsored the Minnesota
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Held Aug. 9, 2000, the summit attracted 44 leaders from the private and public sector, including representatives from city and county government, the Minnesota Department of Transportation, federal government, private engineering firms, industry organizations, and educational institutions. Summit participants focused on the following tasks:

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- Showcasing innovative methods of recruiting and retaining civil engineers, surveyors, and technicians by reviewing nationwide best practices.
- Examining the survey of cities, counties, and industry that assessed the nature of the problem in Minnesota.
- Developing an action plan that collaboratively leverages the resources of all the workforce development stakeholders.
- Defining roles and responsibilities for solving the program among all stakeholders.

Divided into four smaller groups, participants completed problem and vision statements for four key areas:

- Awareness, attraction, access. The problem statement identified the challenge of a lack of interest and respect for civil engineering and technology. The vision statement calls for making the profession more attractive, profitable, and flexible.
• Recruiting. The problem statement identified the challenge of having enough qualified, entry-level technicians and engineers to fill available positions. The vision statement calls for an abundance of qualified candidates.

• Retention and redesign. The problem statement identified the challenges that organizations face in responding to and preparing for the changing needs of the workforce, including greater pay and benefits, greater career opportunities, enhanced skills, and family needs. The vision statement calls for development of a tool box with strategies to motivate and satisfy employees, to provide greater flexibility, to build cooperative labor-union partnerships, and to create and support an empowering environment.

• Re-recruiting. The problem statement identified the need to recognize, attract, and match skills of adults in transition. The vision statement calls for recruiting more employees by matching their skills to their life goals.

Shortly after the summit, the panel that organized the summit met to address next steps. The panel discussed the need to develop an interdisciplinary initiative to continue implementing summit ideas.

The RIC agreed to organize a steering committee to manage a statewide civil engineering workforce development initiative. Charter steering committee members are asked to contribute seed funding to support the hiring of a part-time project manager, who will coordinate all information and best
practices from other agencies and assist in developing and executing a three-year plan.

By the end of January 2001, the RIC succeeded in soliciting seed funding from several sources.

The steering committee and project manager will take the summit work to the next level by planning and executing a coordinated statewide program that draws on the resources of state and local governments, educational institutions, and private engineering firms. The steering committee’s ultimate goals involve increasing the supply of civil engineers and technicians and developing programs that make it easier for stakeholders to recruit and retain civil engineers and technicians in Minnesota.

The collaborative approach—one of the hallmarks of the RIC—increases the likelihood of success, organizers say. As one summit participant said, “The challenges we face are a transportation community problem...and it’s going to take the community working together to solve it.”
CHAPTER ONE
Summary of Proceedings
Minnesota Summit on
Civil Engineering Workforce Development

— Summary of Proceedings —

On August 9, 2000, 44 leaders from the private and public sector gathered at Dunwoody Institute in Minneapolis, Minnesota to participate in a Minnesota Summit on Civil Engineering Workforce Development (see Appendix I, Participant List). The Summit was sponsored by the Local Road Research Boards' — Research Implementation Committee (LRRB-RIC) to address the recruiting and retention challenges currently facing the civil engineering profession.

Leaders in both the private and public sector, finding it increasingly challenging to attract and keep talented civil engineers, surveyors and technicians, met to:

- Review recent research on the expected demand and supply of civil engineers, surveyors, and technicians.
- Showcase innovative methods of recruiting and retaining civil engineers, surveyors, and technicians.
- Develop an action plan which collaboratively leverages the resources of all the workforce development stakeholders.
- Define roles and accountabilities for solving the problem among all stakeholders.

Those attending included representatives from:

<table>
<thead>
<tr>
<th>Category</th>
<th>Data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. City Govt</td>
<td>Number Attended</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>5%</td>
</tr>
<tr>
<td>2. County Govt</td>
<td>Number Attended</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>18%</td>
</tr>
<tr>
<td>3. MnDOT</td>
<td>Number Attended</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>20%</td>
</tr>
<tr>
<td>4. Federal</td>
<td>Number Attended</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>7%</td>
</tr>
<tr>
<td>5. Education</td>
<td>Number Attended</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>36%</td>
</tr>
<tr>
<td>6. Private Firms</td>
<td>Number Attended</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>14%</td>
</tr>
<tr>
<td>Total Number Attended</td>
<td></td>
<td>44</td>
</tr>
<tr>
<td>Total Percent</td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>
The Summit —

Welcome
Dick Hansen, Chair of Project Subcommittee Research Implementation Committee (RIC), opened the Summit with a Welcome to all participants and an invitation to join with the RIC in generating solutions to the challenges currently facing the profession.

Research Findings
In keeping with a major objective of the Summit — To review recent research on the expected demand and supply of civil engineers, surveyors, and technicians — findings from research conducted by Henderson Associates, consultants to RIC to coordinate the Summit, were presented. Research was conducted in the following areas:
- United States and Minnesota Demographics of the Workforce
- Civil Engineering Education Trends; Demand and Supply for Civil Engineering Professionals
- An Employer Workforce Survey of Minnesota City, County, State, and Federal government plus Private Engineering Firms to identify critical workforce issues
Appendix II contains summaries of the findings.

Best Practices
Another major objective — To showcase innovative methods of recruiting and retaining civil engineers, surveyors, and technicians — was met by reviewing best practices. Best Practices utilized by other DOT’s nationwide. A Best Practices Self-Assessment survey of participants showed that the majority of those attending felt they were not competitive in their recruiting/assessment, retention or strategic staffing programs.

Civil Engineering Workforce Model
Henderson Associates also presented two workforce models:
- An overview of Recruiting and Retention of the workforce
- A Civil Engineering Workforce Model depicting the critical recruiting and retention decision-points.
  This model was used as a springboard from which problem statements and short/long term solutions were generated later in the Summit

Panel Discussion
A panel of six individuals representing major phases of civil engineering professional’s career was provided to put a “human face” on the workforce development issues with which the Summit is dealing. Panel members represented:
- Encouraging pre-college students to consider civil engineering
- Making the commitment to civil engineering as a college student
- Experiencing the hiring and orientation process as a new employee
- Mid-career decisions
- Looking back on a long career
Participants' Input
Using the four major phases of the Civil Engineering Workforce Development Model, four issue groups were formed:
• Awareness, Attraction and Access
• Recruiting
• Retention and Redesign
• Re-Recruiting
Participants self-selected the area in which they were most interested and generated problem statements describing the current situation, and vision statements identifying future possibilities.
Each group reported its conclusions and received input from other participants.

Action Plan Development
The four groups created action plans designed to move toward reaching the vision for their area of interest. Theses plans are presented in the next section, Section 3: Vision & Action Plans. Each group reported their plans and received input from other participants.

Post-Summit Next Steps
These include:
1. Creation a summary of the Summit for distribution to all participants (this document)
2. Review of the Summit Vision and Action Plans by the RIC Technical Advisory Panel by the end of September
3. Creation of a leader and listing of the next steps for each of the four issue groups by the Technical Advisory Panel
4. Overall coordination for future work will be overseen by the RIC.

Closing
Closing remarks were provided by Dick Hansen, Chair of Project Subcommittee Research Implementation Committee (RIC), thanking the group for attending and generously sharing their knowledge, expertise and visions for the future.

Participants were asked to complete an evaluation of the Summit; the results are shown in Appendix III.
CHAPTER TWO
Vision and Action Planning
Minnesota Summit on
Civil Engineering Workforce Development

— Vision & Action Planning —

One of the major objectives of the Summit was to...

*Develop an action plan which collaboratively leverages*
*the resources of all the workforce development stakeholders.*

The first step in developing the action plan was completed by the participants during the Summit. Using the four major phases of the Civil Engineering Workforce Development Model, four issue groups were formed:

* Awareness, Attraction and Access — working with issues related to increasing awareness of the profession at an early age (prior to selecting an educational career path), presenting the profession such that it is an attractive career alternative, and creating access to the profession

* Recruiting — working with issues related to recruiting qualified candidates into existing and new positions

* Retention and Redesign — working with issues related to keeping good employees in the organization and the profession, and redesigning organizations and positions to insure retention

* Re-Recruiting — working with issues related to the loss of the profession’s wisdom base through retirement, attracting those making mid-life career changes or re-entering the workforce

Participants self-selected the area in which they were most interested and generated problem statements describing the current situation, and vision statements identifying future possibilities (see attachment A for a list of group members). They also began the process of creating action plans and strategies: what needs to be accomplished in the short term and in the long term, identifying the stakeholders associated with each action, and assigning responsibility for the completion of the action plan.

The preliminary action planning summaries by group are presented on the following pages.
## Summit Action Planning

### Awareness, Attraction, Access (3A's)

<table>
<thead>
<tr>
<th>Problem Statement:</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of interest/respect for Civil Engineering and Technology</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vision Statement:</th>
<th>Notes:</th>
</tr>
</thead>
</table>
| Make it cool, profitable and flexible. Student and worker friendly | • Public awareness and recognition of CE/T  
• Consistent influx of potential, competent civil employees and students  
• Math counts (MSPE)  
• MnDOT programs as a model for others  
• Career Transportation Day involvement with schools  
• MPWA Program  
• Services by professional societies to promote the industry (RIC; LRRB)  
National campaign  
State campaign  
TV, Bumper stickers, Web sites, videos |

<table>
<thead>
<tr>
<th>Action Strategies &amp; Plans:</th>
<th>Stakeholders:</th>
<th>Short/Long Term</th>
<th>Assign to:</th>
</tr>
</thead>
</table>
| 1. Media blitz:           |               | Long Term       | FHWA/MnDOT/UsDOT  
• TV  
• Bumper stickers  
• (Cool) Web sites  
• Channel 1 (educational to all HS in Mn)  
• Cable (Public access channel) | | Professional org  
RIC  
MnDOT |
<p>| 2. Coordinate promotional programs | | | Technology Transfer |
| 3. Statewide future Engineers' clubs for students | | | Professional Orgs |
| 4. Engineers Week | | | |
| 5. Power Point presentations | | | |
| 6. Develop classroom activities | | | |</p>
<table>
<thead>
<tr>
<th>List of stakeholder organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>MnDOT</td>
</tr>
<tr>
<td>ASCE</td>
</tr>
<tr>
<td>NACE</td>
</tr>
<tr>
<td>FHWA</td>
</tr>
<tr>
<td>AASHTO</td>
</tr>
<tr>
<td>MAPA</td>
</tr>
<tr>
<td>CEAM</td>
</tr>
<tr>
<td>RIC</td>
</tr>
<tr>
<td>Dunwoody</td>
</tr>
</tbody>
</table>
## Summit Action Planning

### RECRUITING

<table>
<thead>
<tr>
<th>Problem Statement:</th>
<th>Notes:</th>
</tr>
</thead>
</table>
| There are not enough qualified, entry-level techs/engineers to fill available positions. | 1. Not enough candidates  
2. Recruiters’ knowledge of Civil Engineering  
3. Team/Industry JOINT EFFORT  
4. Long term planning |

<table>
<thead>
<tr>
<th>Vision Statement:</th>
<th>Notes:</th>
</tr>
</thead>
</table>
| An abundance of qualified candidates | 1. Industry video promoting CE for schools/job fairs, tech. (push technological products)  
2. Large-scale advertising  
3. Internships for guaranteed placement  
4. Marketing CE tuition reimbursement |

### Action Strategies & Plans:

<table>
<thead>
<tr>
<th>Action Strategies &amp; Plans:</th>
<th>Stakeholders:</th>
<th>Short/Long Term</th>
<th>Assign to:</th>
</tr>
</thead>
</table>
| 1. Team/Industry joint effort in recruiting | MnDOT  
Local agencies  
Private Contractors  
Private Consultants  
Academia  
Societies | Long Term: Increase recruiting  
Short Term: Get group together | Individual from each agency |
| 2. Marketing:  
• Tuition reimbursement  
• Video (CE)  
• Job Fairs  
• Schools  
• Push Tech products  
• Internships  
• Guaranteed placements  
• Internet/Web | Knowledgeable marketing group:  
MnDOT  
FHWA  
SALT  
CEC  
AGC  
MAPA  
ARM  
Educator groups  
Dept of Econ Sec | Long Term: Marketing action to educate consumer on CE  
Short Term: Plan | Representatives from whole industry, academia |
### Summit Action Planning

**RETENTION & REDESIGN**

<table>
<thead>
<tr>
<th>Problem Statement:</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizations have difficulty flexibly responding to and preparing for the changing needs of the workforce including:</td>
<td>Currently:</td>
</tr>
<tr>
<td>• Greater pay &amp; benefits</td>
<td>• Reward systems based on traditional measures (length of service, not performance-based)</td>
</tr>
<tr>
<td>• Greater career opportunities (promotion, variety, challenge)</td>
<td>• Reactive mode to retention issues</td>
</tr>
<tr>
<td>• Enhanced skills/abilities, new skills</td>
<td>• Pay, benefits – lower wages</td>
</tr>
<tr>
<td>• Family/life needs</td>
<td>• Family/spouse, career opportunities &amp; needs</td>
</tr>
<tr>
<td></td>
<td>• Limited upward mobility (Contributing issue is the required relocation or travel for upward mobility)</td>
</tr>
<tr>
<td></td>
<td>• Less interest to travel/relocate</td>
</tr>
<tr>
<td></td>
<td>• Community expectations of government</td>
</tr>
<tr>
<td></td>
<td>• Less loyalty to one organization — go where individual opportunities are</td>
</tr>
<tr>
<td></td>
<td>• Job salaries are compared to similar-sized organizations</td>
</tr>
<tr>
<td></td>
<td>• Small organizations (county/city) provide entry-level opportunities; then employees spring-board to other outside career opportunities</td>
</tr>
<tr>
<td></td>
<td>• Need to define desired level of skills/abilities and determine how to retain level of expertise</td>
</tr>
<tr>
<td></td>
<td>• Employees (particularly tech level) stagnate in job, no longer challenged, then move on to opportunities</td>
</tr>
<tr>
<td></td>
<td>• Lack of access to continuing education</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vision Statement:</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizations employing civil engineering personnel offer:</td>
<td>Vision Elements:</td>
</tr>
<tr>
<td>• A “tool box” of strategies to motivate, satisfy and share success, and challenge employees</td>
<td>• Flexible</td>
</tr>
<tr>
<td>• Greater flexibility in how work is performed</td>
<td>• Retention effort</td>
</tr>
<tr>
<td>• Cooperative labor-union partnerships</td>
<td>• Success sharing (bonuses, salary increase, increased vacation days, recognition, title change, celebrate success events, increased travel to training and development, telecommuting, flex-time, job share, etc.)</td>
</tr>
<tr>
<td>• Environment which empowers and enables employees to take responsibility for their own growth and development</td>
<td>• Employee freedom and empowerment to strengthen job scope, new challenges, etc. It's up to them. Organizations respond by eliminating barriers.</td>
</tr>
<tr>
<td></td>
<td>• Managers/organizations provide environment &amp; opportunity for growth, but it is the responsibility of the employee to make it happen.</td>
</tr>
<tr>
<td></td>
<td>• Variety of success sharing opportunities — “tool box”</td>
</tr>
<tr>
<td></td>
<td>• managerial &amp; labor union flexibility in how work is performed.</td>
</tr>
</tbody>
</table>
### Action Strategies & Plans:

<table>
<thead>
<tr>
<th></th>
<th>Stakeholders:</th>
<th>Short/Long Term</th>
<th>Assign to:</th>
</tr>
</thead>
</table>
| 1. Work with unions in exploring how “tool box” of retention strategies could be implemented | Labor/Management  
• Labor: Bus Agent  
• Mgmt: CEO (City/City Admin) | Long term |           |
| 2. Raise awareness and build support of city council, county board members for “tool box” retention strategies. Cost-benefit awareness. | County Admin  
City Councils/County Boards |          |           |
| 3. Create line-supervisor (middle-management) support for retention strategies and their implementation | Supervisors  
Senior Management |          |           |
| 4. Survey employees on their desired retention strategies (what needs are not met? What’s most important?) | Employees  
Supervisors/Mgrs |          |           |
| 5. Raise public awareness that investment in public employee continuing education is worthwhile/necessary  
• PSA program effort | Council/County Board  
Tax payer |          |           |
| 6. Examine existing workforce for unrecognized, underutilized skills and abilities and identify training, advancement, and lateral opportunities | Middle Managers  
Line Supervisors  
Employees  
HR staff |          |           |
# Summit Action Planning

## RE-RECRUITING

<table>
<thead>
<tr>
<th>Problem Statement:</th>
<th>Notes:</th>
</tr>
</thead>
</table>
| How do we identify, attract and match skills of adults in life transition and opportunities in CE & Tech profession and change the rules to allow it. | • Capture life transition  
• Knowledge transfer  
• Legislative restrictions:  
  – Income limits  
  – Double-dipping  
• Experience vs. education (giving credit)  
• Matching skills from other work to CE  
• Public perception  
• Risk of technological obsolescence (not keeping up)  
• Lack of professional network  
• Continuing education/licensure  
• Lack of recognition of the “pool” |

<table>
<thead>
<tr>
<th>Vision Statement:</th>
<th>Notes:</th>
</tr>
</thead>
</table>
| The CE profession fills part of its workforce needs by recruiting more individuals by matching their skills to their life transition goals. | • Re-recruiting of retirees, employees on leave, employees who have left the field, people leaving other careers  
• Flexible work hours  
• Staying in touch with peers  
• Balancing work and family  
• Opportunities for re-training or new training  
• Opportunities to transfer skills  
• Work at home (Internet)  
• Project by project work (use of specialized skills) |
<table>
<thead>
<tr>
<th>Action Strategies &amp; Plans:</th>
<th>Stakeholders:</th>
<th>Short/Long Term</th>
<th>Assign to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Videotape of local engineering opportunities and duties — geared towards a re-careering audience</td>
<td>Industry, Cities, Counties, MnDOT</td>
<td>Short Term: Develop, Long Term: Market</td>
<td>RIC</td>
</tr>
<tr>
<td>2. Legislative changes to allow public retirees to work on a part-time basis</td>
<td>Cities, Counties, MnDOT</td>
<td>Long Term</td>
<td>LMC/AMC, MnDOT</td>
</tr>
<tr>
<td>without sacrificing benefits (allow for transitional working time)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Expert resource database (skills bank) for training, specific projects,</td>
<td>All</td>
<td>Short Term: Develop, Long Term: Market</td>
<td>Technology Transfer (T³)</td>
</tr>
<tr>
<td>technical assistance, etc. Out-of-state experts, university alumni</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Different level of licensure for those not wishing to maintain PE. Para-professional position.</td>
<td>All Board of AELSGID</td>
<td>Long Term</td>
<td>LMC/AMC, Board, MnDOT</td>
</tr>
</tbody>
</table>
CHAPTER THREE
Action Plan and Implementation
Minnesota Summit on
Civil Engineering Workforce Development

— Action Plan & Implementation Recommendations —

The fourth objective of the Summit — To define roles and accountabilities for solving the problem among all stakeholders — is addressed in the following pages and will be further addressed by the Technical Advisory Panel and the Local Roads Research Board’s Research Implementation Committee.

GENERAL RECOMMENDATIONS

These recommendations are directed toward developing the cross-organizational capabilities to work collaboratively and dedicate resources to the initiative.

A. Form steering committee

An oversight group having overall ownership for the initiative with responsibility for coordinating the work of the action teams is needed. This could be some variation on the existing RIC or an altogether new group to broaden the base of participation. In defining this group consider the following criteria:

1. Good, but not necessarily complete, stakeholder representation. Refer to the stakeholders list developed during the Summit.

2. A willingness to commit resources to the initiative

3. Individuals and organizations needed to implement the action plan

4. Individuals and organizations, who if not involved, could be an impediment to implementing the plan

B. Inventory stakeholders

Again, referring to the stakeholders list developed during the Summit, conduct an inventory of each of the organizations asking:

1. What is your level of interest in participating in this initiative?

2. What resources do you have at your disposal that you would consider contributing to this initiative?
   • Staff time
   • Promotion media / capabilities
   • Education / training capabilities
   • Other

C. Form action teams

The action teams would be responsible for:
• Refining and expanding the action plans started in the Summit and
• Facilitating their implementation
Form action teams — continued

The first to consider recruiting are the Summit participants who took part in the Summit and have already demonstrated their interest in the subject. These groups should be cross-functional and cross-organizational to provide as broad a perspective on the issue as possible. The team should also prioritize the actions along two parameters:

1. Length of time to implement — short-term / long-term
2. Criticality:
   • Urgent — do before anything else. Apply maximum resources first
   • Important — do after urgent actions, or if resources still available
   • Development — good ideas but “back burner” that will build on accomplishment of urgent and important actions.

D. Set improvement metrics

The steering committee should select, develop and monitor a set of metrics to determine the degree of improvement the initiative is providing. Some possible metrics include:

1. Average job placement cycle time
2. Average time positions go unfilled
3. Growth in civil engineering education program enrollments
4. Percentage of retirees doing part-time work in the profession

The metrics can be reported to stakeholders on a regular basis.

E. Develop initiative budget and gain stakeholder funding commitments

Once action plans are completed a budget should be developed to fund its implementation. Funds will likely come from a variety of sources including stakeholder budgets, grants, and special appropriations.

F. Conduct a 1/2 day follow-up Summit

To provide the opportunity for those who participated in the first Summit to gather, refine action plans, commit to the initiative, set improvement metrics and develop preliminary budgets.

AWARENESS, ATTRACTION, ACCESSIBILITY RECOMMENDATIONS

A. This is more of a caveat than a recommendation, but stakeholders need to recognize this is not an immediate gratification solution. The ultimate success of this part of the process may well not be seen for years to come. It is the “filling the pipeline” of young people to enter the profession.

B. Cross-train engineers and teachers. In addition to giving teachers experiences in civil engineering, also have teachers train engineers on how to communicate with children and teens in the school setting.
C. Consider developing an “attraction” web site geared to children — interactive; perhaps allowing them to “build a bridge” or “design an intersection” as a game.

RECRUITING RECOMMENDATIONS

A. Consider Mn/DOT as central recruiting organization for all government levels. Alabama has a model that is worth further investigation. Rather than a all against all competition for employees Mn/DOT could become the clearing house for cities and counties searching for employees.

B. Consider forming a non-profit recruiting agency that provides a supply of engineer and technicians candidates to Cities and Counties as needed.

C. Brainstorm new, innovative methods for attracting candidates to remote locations, offering special incentives or simply create a brochure on the advantages of “country living”.

D. Provide Cities and Counties with a checklist of suggested steps to take when recruiting new employees.

RETENTION/REDESIGN RECOMMENDATIONS

A. Offer seminars on retention best practices. Recruiting excellent employees will not be the solution if stakeholders are not equipped to provide the kind of work environment that keeps them. One step in ensuring retention is to make stakeholders aware of how the workplace has changed and what causes employees to leave or stay.

B. Consider purchasing employee satisfaction survey administration, competitive salary and benefit surveys, and other methods for retention — as a group for use by smaller Cities and Counties.

C. Provide Cities and Counties with a checklist of suggested programs to consider to retain current employees.

RE-RECRUITING RECOMMENDATIONS

A. Build knowledge base of retired / retiring employees. Small and large organizations alike find ways to capture the accumulated knowledge of employees who are soon to retire. This can happen through one of three ways:

1. Phased retirement

2. Post-retirement consulting

3. Creation of knowledge bases that transfer retirees knowledge and makes it available to active employees.

B. Recruit early-retiring employees from other industries.
CHAPTER FOUR
Next Steps
Minnesota Summit on
Civil Engineering Workforce Development

-- Next Steps --

On August 30, 2000, the Technical Advisory Panel met to determine the next steps to be taken to bring this initiative into action. After reviewing the work done at the Summit and the Action Plan & Implementation Recommendations, the Panel discussed alternative ways to ensure the initiative is implemented and gets results that make a positive impact on the Civil Engineering Workforce of the future.

The Panel identified elements necessary to develop cross-organizational capabilities to work collaboratively and dedicate resources to this initiative. These elements include:

- A Steering Committee
  This is an oversight group, composed of stakeholder leaders, having overall ownership for the initiative with responsibility for coordinating the work of the action teams. It will also seek funding to support action projects.

- A "Project Manager"
  An individual responsible for coordinating the Steering Committee and Action Teams and monitoring individual projects.

- Funding
  Funding will be sought from existing organizations to set up a structure and staff (seed money) and to support action plan implementation (project money). Technical Advisory Panel members intend to approach their organizations seeking seed money for this project (CEC, Dunwoody, MAAPT, etc.)

- Fiscal Agent
  An existing organization through which project funds are dispersed and project staff is supervised. The Center for Transportation Study at the University of Minnesota was proposed as the organization of choice.

The Panel developed the following plan to create the structure for the future of this initiative:

**STEP 1: RIC Project Hand-off**

It is proposed that the action plans taken to implement this initiative in the near and longer term are completed through a "stand-alone", independently funded organization supported by the various stakeholders (see Step 3). To effectively accomplish this, with assurance for the continued viability of the project the RIC has started, the creation of an Independent Civil Engineering Workforce Development Initiative is proposed.

The first step in its development is to gather the stakeholders and hand-off the project to them for implementation.

The RIC's continuing involvement in this initiative is essential, however. To remain involved and informed, it is further recommended that the Technical Advisory Panel continue as an active entity and that Dick Hanson serve as an initiative Steering Committee member to keep both the Advisory Panel and the RIC involved and informed.
STEP 2:  **INDEPENDENT INITIATIVE CONFERENCE**
The first stage in establishing the initiative as an independent entity is to bring together stakeholder leaders to accomplish the following:

- Present the plan for the initiative and enroll their support in it
- Solicit seed money to establish the initiative’s structure and staff

The mechanism for accomplishing this is to bring the stakeholders together for an “enrollment” conference and luncheon to be held in early October which has been funded by the RIC.

STEP 3:  **CIVIL ENGINEERING WORKFORCE DEVELOPMENT INITIATIVE**
Form a Steering Committee of stakeholder leaders, hire a “project manager”, secure the fiscal agent, identify action plans and teams, solicit project funding, and develop the structure to implement action plans as described in the *Action Plan & Implementation Recommendations*.

To accomplish *Step 2: Initiative Independence,* the Technical Advisory Panel is planning to hold an *Enrollment Conference & Luncheon* in early October to bring together approximately 25 Stakeholder Leaders and solicit seed money to establish the initiative’s independent structure and staff.
APPENDIX A
The Changing Face of the Workforce
THE CHANGING FACE OF THE WORKFORCE

The existing shortages in the number of degreed Civil Engineers (Engineers) and Civil Engineering Technicians/Surveyor Technicians (Technicians) raise several questions:

- Why are we experiencing shortages in this field at this time?
- Are young people simply not choosing to enter Civil Engineering as a career or is there another reason for the decrease in student populations?
- Is this a nationwide issue or limited to Minnesota?
- Is this a temporary condition or a sign of the future?
- Do those who compete for these employees have differing needs and offerings

These issues are addressed in the research findings that follow.

THE CHANGING FACE OF THE POPULATION

At this time in the history of the United States, we are experiencing a major shift in the demographics of the nation. While total population continues to grow at roughly 1% per year, there are major changes in the composition of the population that are having significant impact on the future of our workforce. Highlights of the changes from 1990 to 1998 include:

- Total population has grown by 8.4% (an increase of 20,860,000 people)
- The population of those under age 14 has grown by 7.4% — less than the average population growth.
- The population of those aged 15 to 24, those preparing for careers, has grown by only 0.9% (an increase of 320,000)
- The population of those aged 25 to 34, prime candidates for entering the workforce, has decreased by 10.1% (a decrease of 4,400,000)
- The population of those 35 to 54, those in mid-career, has grown by 25.6% (an increase of 16,140,000)

The following chart shows the population and age group changes from 1990 – 1998:

<table>
<thead>
<tr>
<th>United States Population</th>
<th>Ages</th>
<th>7/1/90</th>
<th>7/1/98</th>
<th>Diff</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under 14</td>
<td>54,105,654</td>
<td>58,128,808</td>
<td>4,023,154</td>
<td>7.4%</td>
</tr>
<tr>
<td></td>
<td>15 to 24</td>
<td>36,893,819</td>
<td>37,213,461</td>
<td>319,642</td>
<td>0.9%</td>
</tr>
<tr>
<td></td>
<td>25 to 34</td>
<td>43,142,193</td>
<td>38,774,410</td>
<td>(4,367,783)</td>
<td>(10.1%)</td>
</tr>
<tr>
<td></td>
<td>35 to 44</td>
<td>37,773,716</td>
<td>44,519,859</td>
<td>6,746,143</td>
<td>17.9%</td>
</tr>
<tr>
<td></td>
<td>45 to 54</td>
<td>25,191,766</td>
<td>34,584,884</td>
<td>9,393,118</td>
<td>37.3%</td>
</tr>
<tr>
<td></td>
<td>55 to 64</td>
<td>21,092,237</td>
<td>22,675,970</td>
<td>1,583,733</td>
<td>7.5%</td>
</tr>
<tr>
<td></td>
<td>65 to 74</td>
<td>18,098,681</td>
<td>18,395,293</td>
<td>296,612</td>
<td>1.6%</td>
</tr>
<tr>
<td></td>
<td>75 &amp; over</td>
<td>13,140,646</td>
<td>16,005,839</td>
<td>2,865,193</td>
<td>21.8%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>249,438,712</td>
<td>270,298,524</td>
<td>20,859,812</td>
<td>8.4%</td>
</tr>
</tbody>
</table>

For the nation as a whole, these changes mean there are:

- Proportionately fewer individuals preparing for careers (ages 15 to 24) and
- Fewer absolute numbers of people entering the workforce (ages 25 to 34) to take the places of those in mid-career (ages 35 to 54).

---

THE CHANGING FACE OF THE MINNESOTA WORKFORCE

Like the nation as a whole, Minnesota is experiencing a major shift in demographics — to a greater degree than is the nation as a whole. Highlights of the changes from 1990 to 1998 include:

- Minnesota's population has grown by 7.7% (an increase of 338,000 people)
- The population of those under age 14 has grown by only 2.7% — significantly less than the average and the nation as a whole.
- The population of those aged 15 to 24, those preparing for careers, has grown by 8.6% (an increase of 53,000) — a significantly greater percentage than the nation as a whole.
- The population of those aged 25 to 34, prime candidates for entering the workforce, has decreased by 16.6% (a decrease of 129,000) — a significantly larger decrease than the nation as a whole.
- The population of those 35 to 54, those in mid-career, has grown by 28.6% (an increase of 314,000) — a significantly greater percentage than the nation as a whole.

The following chart shows the population and age group changes from 1990 – 1998:

<table>
<thead>
<tr>
<th>Ages</th>
<th>7/1/90</th>
<th>7/1/98</th>
<th>Diff</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 14</td>
<td>1,004,266</td>
<td>1,031,860</td>
<td>27,594</td>
<td>2.7%</td>
</tr>
<tr>
<td>15 to 24</td>
<td>614,093</td>
<td>667,030</td>
<td>52,937</td>
<td>8.6%</td>
</tr>
<tr>
<td>25 to 34</td>
<td>777,299</td>
<td>648,006</td>
<td>(129,293)</td>
<td>(16.6%)</td>
</tr>
<tr>
<td>35 to 44</td>
<td>671,200</td>
<td>810,506</td>
<td>139,306</td>
<td>20.8%</td>
</tr>
<tr>
<td>45 to 54</td>
<td>428,884</td>
<td>603,729</td>
<td>174,845</td>
<td>40.8%</td>
</tr>
<tr>
<td>55 to 64</td>
<td>343,590</td>
<td>381,191</td>
<td>37,601</td>
<td>10.9%</td>
</tr>
<tr>
<td>65 to 74</td>
<td>294,827</td>
<td>292,903</td>
<td>(1,924)</td>
<td>(0.7%)</td>
</tr>
<tr>
<td>75 &amp; over</td>
<td>253,040</td>
<td>290,194</td>
<td>37,154</td>
<td>14.7%</td>
</tr>
<tr>
<td>Total</td>
<td>4,387,199</td>
<td>4,725,419</td>
<td>338,220</td>
<td>7.7%</td>
</tr>
</tbody>
</table>

For the state of Minnesota, these changes mean there are:
- Proportionately more individuals preparing for careers (ages 15 to 24) than the nation as a whole and
- Significantly fewer absolute numbers of people entering the workforce (ages 25 to 34) to take the places of those in mid-career (ages 35 to 54).

There are 163,000 fewer people in the 25 to 34 year old group preparing to enter the full time workforce and move into the entry level jobs presumably vacated by the 35 to 44 year old group!

Herein lies the current challenge in the workforce: Too few numbers of people ages 25 to 34 are available to enter and move through the workforce in any occupation in the nation — and more so in Minnesota.

Unlike the nation as a whole, however, Minnesota has proportionately more 15 to 24 year olds preparing for careers — presenting a prime opportunity to vigorously recruit in the short term.

In the longer term, Minnesota will be faced with the challenge of proportionately fewer people under 14 than the nation as a whole, and should begin career recruiting immediately to ensure the future of the workforce.
APPENDIX B
Education Supply and Demand
THE CIVIL ENGINEERING WORKFORCE
EDUCATION, SUPPLY AND DEMAND

CIVIL ENGINEERING EDUCATION

Degreed Engineers
According to the National Center for Education Statistics, the number of earned bachelor's degrees in the United States increased 24% from 1981 through 1995. The number of Civil Engineering degrees during that same period, however, has remained flat (see data below).

In addition, a major change has occurred in the demographic composition of the graduates: the number of male graduates has declined by nearly 11%, while the number of female graduates has increased by 87%!

<table>
<thead>
<tr>
<th>Bachelor's</th>
<th>1981</th>
<th>1985</th>
<th>1990</th>
<th>1995</th>
<th>Chg 95 vs 81</th>
<th>% Chg</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Degrees:</td>
<td>946,877</td>
<td>990,877</td>
<td>1,062,151</td>
<td>1,174,436</td>
<td>227,559</td>
<td>24.0%</td>
</tr>
<tr>
<td>Engineering</td>
<td>63,717</td>
<td>77,572</td>
<td>64,705</td>
<td>63,371</td>
<td>(346)</td>
<td>(0.5%)</td>
</tr>
<tr>
<td>Civil Eng</td>
<td>11,331</td>
<td>9,730</td>
<td>7,992</td>
<td>11,329</td>
<td>(2)</td>
<td>(0.0%)</td>
</tr>
<tr>
<td>• Males</td>
<td>10,100</td>
<td>8,388</td>
<td>6,730</td>
<td>9,031</td>
<td>(1,069)</td>
<td>(10.6%)</td>
</tr>
<tr>
<td>• Females</td>
<td>1,231</td>
<td>1,342</td>
<td>1,262</td>
<td>2,298</td>
<td>1,067</td>
<td>86.7%</td>
</tr>
<tr>
<td>% Female</td>
<td>10.9%</td>
<td>13.8%</td>
<td>15.8%</td>
<td>20.3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of those graduating with a bachelor's degree in engineering, the 1999 estimated percentage of non-native born individuals is 17%.

According the American Association of Engineering Societies Engineer Workforce Commission, Civil Engineering is among the most popular Engineering disciplines as of 1999, second only to Mechanical and Electrical Engineering (see attached diagram). It also ranks among the most popular with women.

Civil Engineering Technicians
The national data for Civil Engineering Technicians certificates is not easily available, as it is often combined with other technical fields or, in some states, not granted a certificate.

In Minnesota, however, the education trend is clear; the number of enrollments in Civil Engineering/Civil Technology, Drafting and other related technical engineering programs over the past three years has experienced almost a 10% decline in the majority of technical colleges (see attached chart). Some programs are in danger of being discontinued due to lack of enrollment and, in some cases, declining numbers of graduates.
CIVIL ENGINEERING DEMAND

Degreed Engineers
While the number of degreed engineers has remained flat in the nation, demand for them is “expected to increase faster than the average for all occupations through 2008.”

In 1998, there was an estimated 195,000 civil engineer positions in the United States. Nearly half were employed by private consulting firms, one third were employed by federal, state and local government agencies and the remainder were employed by the construction industry, public utilities, transportation and manufacturing industries. Of the 195,000 employed civil engineers, roughly 12,000 were self-employed, many as consultants.

In Minnesota in 1996, according to the Minnesota Workforce Center, there were 2,650 civil engineer positions — with an anticipated growth rate of 28% by the year 2008. The demand for Civil Engineers is expected to grow at an average of 140 openings per year.

Civil Engineering Technicians
In 1998, there were an estimated 2,580 technician positions in the state of Minnesota. While the new job opening growth rate is estimated at less than 10% from 1994 to 2005, the data may well be outdated and did not take into account the number of new positions required due to the expanding economy nor the number of retirements anticipated in the next five plus years.

Regardless of the growth percentage, the demand will surely outstrip the supply unless technical college recruiting becomes a top priority!

CIVIL ENGINEERING CRITICAL GAPS

Degreed Engineers
With no growth rate in the number of civil engineer bachelor’s degrees and a 28% anticipated growth rate in new positions, there is clearly a growing critical gap between the demand for degreed civil engineers and the available supply. While women are entering the profession in increasing numbers, the fact that the number of men are declining offsets any gain!

Civil Engineering Technicians
With a declining enrollment in civil engineering and related fields in Minnesota technical colleges and an anticipated minimum growth rate of nearly 10% in technician related positions, there is again a growing critical gap between demand and supply. With the challenges in the demographics of the Minnesota population, recruiting into technical colleges must begin immediately.

1 National Center for Education Statistics
2 Source: National Science Foundation, Science Resources Studies; February 1999
3 MnSCU Research and Planning, July 2000
APPENDIX C
Employee Workforce Survey
EMPLOYER WORKFORCE SURVEY

This survey was developed in conjunction with and tested by the members of the Local Road Research Board Workforce Summit Technical Advisory Panel in the summer of 2000. It was designed to identify the following from the major Minnesota employers of degreed Engineers and Civil Engineering Technicians/Surveyor Technicians:

• The number of degreed Civil Engineers (Engineers) and Civil Engineering Technicians/Surveyor Technicians (Technicians) today & five years into the future

• Demographic composition of the workforce including gender, ethnicity and national origin

• Pay rates by profession and employer group

• Anticipated retirements in the next five years

• The number of unfilled positions & time unfilled

• Recruitment programs in place and planned

• Recruitment to placement time cycle

• Recruiting resources sources used

• Retention programs in place & planned

• Major roadblocks to recruiting and retaining

Surveys were sent and returned from the following groups:

<table>
<thead>
<tr>
<th>Group</th>
<th>Sent Out</th>
<th>Completed Surveys</th>
<th>Percent Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Engineers:</td>
<td>133</td>
<td>54</td>
<td>41%</td>
</tr>
<tr>
<td>• Metro</td>
<td></td>
<td>30 (56%)</td>
<td></td>
</tr>
<tr>
<td>• Outstate</td>
<td></td>
<td>24 (44%)</td>
<td></td>
</tr>
<tr>
<td>County Engineers:</td>
<td>91</td>
<td>70</td>
<td>77%</td>
</tr>
<tr>
<td>• 7 Cty Metro</td>
<td></td>
<td>5 (7%)</td>
<td></td>
</tr>
<tr>
<td>• Outstate</td>
<td></td>
<td>59 (84%)</td>
<td></td>
</tr>
<tr>
<td>• Unidentified</td>
<td></td>
<td>6 (9%)</td>
<td></td>
</tr>
<tr>
<td>State Govt</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Federal Govt</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Academia</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Private Firms</td>
<td>40</td>
<td>15</td>
<td>38%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>267</td>
<td>142</td>
<td>53%</td>
</tr>
</tbody>
</table>

The data was tabulated for all responses and by individual employer groups to identify differences in different classes of employers.
SIGNIFICANT FINDINGS

The data shows major differences between the larger employer groups (City government, County government, State government and Private Engineering Consulting Firms)

The majority of city and county governments differ from private firms and state government in the following areas:

- A smaller Engineer and Technician workforce with less diversity and few unfilled positions
- Anticipate needing no additional Engineer and Technician positions and having no retirements over the next five years
- Lowest entry-level Engineer salary is the highest ($45,000 and over versus $35,000 to $39,000)
- Highest Engineer salary is the lowest ($60,000 to $79,999 versus $80,000 to over $100,000)
- Lowest entry-level Technician pay is the same in all groups
- Highest Technician pay is lowest in county government ($15 - $19.99 versus $20 - $24.99 cities and state, and $20 to over $25 private firms)
- Fewer benefits are provided — primarily health insurance and paid retirement plans; vehicles are provided by some to Engineers
- No continuous recruiting processes nor retention programs, with no plans to create them
- Few or no modifications to their hiring process to attract candidates
- Primary recruiting resources are newspaper advertising and Professional Associations and Publications

Private firms and state government have:

- A larger, more diverse workforce with many unfilled positions
- Anticipate adding both Engineer and Technician positions over the next five years and, anticipate experiencing significant retirements in both groups
- Lower entry-level Engineer salaries, with higher high-end salaries than cities and counties
- Higher high-end Technician pay, with the same entry-level pay than cities and counties
- The same benefits plus bonus or merit pay and private firms often provide other benefits such as 401K plans, flexible benefit plans and life insurance
- Continuous Recruiting Programs; private firms have Retention Programs
- Use of more Recruiting Resources including the Internet and employee referrals
- Made modifications to the hiring process to attract candidates
All Organizations Highlights

Summary of Findings —

<table>
<thead>
<tr>
<th>Workforce Findings</th>
<th>Degreed Engineers</th>
<th>Technicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of positions</td>
<td>73% have 1 - 5 positions</td>
<td>68% have 1 - 5 positions</td>
</tr>
<tr>
<td>Workforce composition</td>
<td>73% Caucasian Men only</td>
<td>67% Caucasian Men only</td>
</tr>
<tr>
<td>Future positions needed</td>
<td>53% forecast needing none</td>
<td>35% forecast needing none</td>
</tr>
<tr>
<td></td>
<td>35% need 1 - 5 positions</td>
<td>52% need less than 5</td>
</tr>
<tr>
<td>Scheduled retirements</td>
<td>65% have none</td>
<td>49% have none</td>
</tr>
<tr>
<td></td>
<td>27% have 1 - 5</td>
<td>43% have 1 - 5</td>
</tr>
<tr>
<td>Lowest Entry-level compensation</td>
<td>43% pay $45,000 &amp; over</td>
<td>68% pay $10 - $14.99 per hour</td>
</tr>
<tr>
<td>Highest compensation currently paid</td>
<td>52% pay $60,000 - $79,999</td>
<td>42% pay $15 - $19.99 per hour</td>
</tr>
<tr>
<td>Vacation</td>
<td>47% provide 6 - 10 days</td>
<td>52% provide 6 - 10 days</td>
</tr>
<tr>
<td></td>
<td>47% provide more than 10</td>
<td>40% provide more than 10</td>
</tr>
<tr>
<td>Unfilled positions</td>
<td>76% have none unfilled</td>
<td>65% have none unfilled</td>
</tr>
<tr>
<td></td>
<td>19% have from 1 - 5 unfilled</td>
<td>28% have from 1 - 5 unfilled</td>
</tr>
<tr>
<td>Longest time position is unfilled</td>
<td>35% more than 6 months</td>
<td>39% more than 6 months</td>
</tr>
</tbody>
</table>

Recruiting & Retaining Findings

| Placement Time Cycle               | 77% from 1 to 3 months |
| Continuous recruiting process      | 88% have none          |
| Recruiting sources used by 50% or more | Newspaper advertising |
|                                    | Educational institutions |
| Hiring Process Modifications       | 60% No modifications; 37% have made modifications |
| Employee Retention Programs        | 68% have none; 8% plan to create programs |
All Organizations Highlights

| NUMBER OF SURVEYS SENT OUT: | 267 |
| NUMBER OF SURVEYS RETURNED: | 142 |
| % RETURN: | 53% |

**Degreed Engineer Positions:**

- Degreed Engineer Positions:
  73% (114) of those reporting have 1-5 degreed engineer positions

- **Composition of Degreed Engineers Workforce:**
  Of those reporting...
  73% (103) employ Caucasian Men only
  13% (18) employ Caucasian Men & Women
  3% (4) employ Caucasian Men, Minority Men & Women
  2% (3) employ Women engineers only
  2% (3) employ Caucasian Men, Minority Men, Women & Non US Citizens
  2% (3) employ Caucasian Men, Women & Non US Citizens
  1% (2) employ Caucasian & Minority Men
  1% (1) employ Caucasian Men, Minority Men & Non US Citizens
  4% (5) have no degreed engineers in their employment

- **Additional Positions Forecast:**
  53% (75) report needing zero new degreed engineering positions in the next five years; 35% (49) report needing less than 5 new degreed engineering positions

- **Scheduled for Retirement:**
  65% (93) report having NO engineers scheduled for retirement in the next five years;
  27% (39) report having 1-5 retirements scheduled

- **Lowest Entry-level Base Salary:** 43% (61) = $45,000 & over

<table>
<thead>
<tr>
<th>6. What is the lowest entry-level base salary that you are currently paying a degreed Civil Engineer in your organization?</th>
<th>Data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No Answer</td>
<td>Responses</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>5%</td>
</tr>
<tr>
<td>2. Less than $30,000</td>
<td>Responses</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>3%</td>
</tr>
<tr>
<td>3. $30,000 - $34,999</td>
<td>Responses</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>13%</td>
</tr>
<tr>
<td>4. $35,000 - $39,999</td>
<td>Responses</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>22%</td>
</tr>
<tr>
<td>5. $40,000 - $44,999</td>
<td>Responses</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>14%</td>
</tr>
<tr>
<td>6. $45,000 &amp; over</td>
<td>Responses</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>43%</td>
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</table>

Total Responses | 142 |
Total Percent | 100%
Highest Base Salary Currently Paid: 52% (74) = $60,000 - $79,999

<table>
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<tbody>
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<tr>
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<tr>
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<tr>
<td>Percent</td>
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</tr>
<tr>
<td>Responses</td>
<td>74</td>
</tr>
<tr>
<td>Percent</td>
<td>52%</td>
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<tr>
<td>Responses</td>
<td>36</td>
</tr>
<tr>
<td>Percent</td>
<td>25%</td>
</tr>
<tr>
<td>Responses</td>
<td>8</td>
</tr>
<tr>
<td>Percent</td>
<td>6%</td>
</tr>
<tr>
<td>Total Responses</td>
<td>142</td>
</tr>
<tr>
<td>Total Percent</td>
<td>100%</td>
</tr>
</tbody>
</table>

Other Benefits Provided on top of base salary include:

- Health Insurance: 95% (135)
- Paid Retirement Plan: 73% (103)
- Dental Insurance: 44% (63)
- Vehicle: 39% (56)
- Bonuses or Merit: 23% (32)
- Other: 19% (27)

Other benefits offered by typically include Life and Disability insurance, 401K plans, Flexible benefit plans and, in one case, up to $2,000 plus 40 paid hours for job related training. (See appendix for all responses)

Vacation:
- 47% (67) provide 6 – 10 days after the second year of employment;
- 47% (67) offer more than 10 days

Unfilled positions Due to Recruitment Challenges:
- 76% (108) have NO unfilled positions
- 19% (27) have from 1 to 5 unfilled positions each

Outside Consultants as Temporary Cover: 39% (56) do not use outside consultants; 25% (35) do use outside consultants to fill in for engineer positions.
All Responses

DEGREE ENGINEER POSITIONS — CONTINUED

☐ Longest Time a Position has been Unfilled due to Recruitment Challenges:
  25% (35) report 6 – 12 months; 22% (31) report 1 – 3 months

<table>
<thead>
<tr>
<th></th>
<th>Data</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>12. What is the longest time a degreed Civil Engineer position has gone unfilled in your organization over the last two years due to recruitment challenges?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. No Answer</td>
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<tr>
<td>Responses</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>2. Less than 1 month</td>
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<td>Responses</td>
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<td>Percent</td>
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<td></td>
</tr>
<tr>
<td>4. 6 - 12 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responses</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>5. More than 12 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responses</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Total Responses</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>Total Percent</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

CIVIL ENGINEERING TECHNICIAN/SURVEYOR TECHNICIAN (TECH) POSITIONS:

☐ Tech Positions:
  63% (89) of those reporting have 1-5 tech positions
  20% (28) report having 6 – 10 positions

☐ Composition of Tech Workforce
  Of those reporting...
  67% (95) employ Caucasian Men only
  20% (29) employ Caucasian Men and Women
  3% (4) employ Caucasian Men, Minority Men & Women
  3% (4) employ Caucasian Men, Minority Men, Women & Non US Citizens
  1% (2) employ Caucasian & Minority Men
  1% (1) employ Women technicians only
  1% (1) employ Caucasian Men, Women & Non US Citizens
  4% (6) have no technicians in their employment

☐ Additional Positions Forecast:
  52% (74) report needing less than 5 new tech positions in the next five years;
  35% (50) report needing zero new tech positions

☐ Scheduled for Retirement:
  49% (70) report having NO techs scheduled for retirement in the next five years;
  43% (61) report having 1 – 5
**TECH POSITIONS — CONTINUED**

**Lowest Entry-level Base Pay:** 68% (96) = $10 - $14.99 per hour

<table>
<thead>
<tr>
<th>17. What is the lowest entry-level base pay that you are currently paying a Civil Engineering Technician/Surveyor Technician in your organization?</th>
<th>Data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>Responses: 8</td>
<td>Percent: 6%</td>
</tr>
<tr>
<td>2. Less than $10 per hr</td>
<td>Responses: 8</td>
<td>Percent: 6%</td>
</tr>
<tr>
<td>3. $10-$14.99 per hr</td>
<td>Responses: 96</td>
<td>Percent: 68%</td>
</tr>
<tr>
<td>4. $15-$19.99 per hr</td>
<td>Responses: 29</td>
<td>Percent: 20%</td>
</tr>
<tr>
<td>5. Over $20 per hr</td>
<td>Responses: 1</td>
<td>Percent: 1%</td>
</tr>
<tr>
<td>Total Responses</td>
<td>142</td>
<td>Total Percent: 100%</td>
</tr>
</tbody>
</table>

**Highest Base Pay Currently Paid:** 42% (60) = $15.00 - $19.99 per hour; 36% (51) = $20.00 - $24.99

<table>
<thead>
<tr>
<th>18. What is the highest base pay that you are currently paying a Civil Engineering Technician/Surveyor Technician in your organization?</th>
<th>Data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No Answer</td>
<td>Responses: 8</td>
<td></td>
</tr>
<tr>
<td>2. Less than $15 per hr</td>
<td>Responses: 7</td>
<td>Percent: 5%</td>
</tr>
<tr>
<td>3. $15-$19.99 per hr</td>
<td>Responses: 60</td>
<td>Percent: 42%</td>
</tr>
<tr>
<td>4. $20-$24.99 per hr</td>
<td>Responses: 51</td>
<td>Percent: 36%</td>
</tr>
<tr>
<td>5. Over $25 per hr</td>
<td>Responses: 16</td>
<td>Percent: 11%</td>
</tr>
<tr>
<td>Total Responses</td>
<td>142</td>
<td>Total Percent: 100%</td>
</tr>
</tbody>
</table>
All Responses

**TECH POSITIONS — CONTINUED**

- **Other Benefits Provided** on top of base salary include:
  - Health Insurance: 95% (135)
  - Paid Retirement Plan: 74% (105)
  - Dental Insurance: 47% (67)
  - Bonuses or Merit: 20% (29)
  - Vehicle: 6% (8)

Other benefits offered by typically include Life and Disability insurance, 401K plans, Flexible benefit plans and, in one case, up to $2,000 plus 40 paid hours for job related training. (See appendix for all responses)

- **Vacation:**
  - 52% (74) provide 6 – 10 days after the second year of employment;
  - 40% (57) offer more than 10 days

- **Unfilled positions Due to Recruitment Challenges:**
  - 65% (92) have NO unfilled positions
  - 28% (40) have from 1 to 5 unfilled positions each

- **Outside Consultants as Temporary Cover:** 40% (57) use outside consultants & 39% do not

- **Longest Time a Position has been Unfilled due to Recruitment Challenges:**
  - 39% (55) report 6 months or more; 34% (48) report 1 – 3 months

<table>
<thead>
<tr>
<th>23. What is the longest time a Civil Engineering Technician/Surveyor Technician position has gone unfilled in your organization over the last two years due to recruitment challenges?</th>
<th>Data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No Answer</td>
<td>Responses 19</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Percent 13%</td>
<td>13%</td>
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<tr>
<td>2. Less than 1 month</td>
<td>Responses 20</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Percent 14%</td>
<td>14%</td>
</tr>
<tr>
<td>3. 1 - 3 months</td>
<td>Responses 48</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Percent 34%</td>
<td>34%</td>
</tr>
<tr>
<td>4. 6 - 12 months</td>
<td>Responses 34</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Percent 24%</td>
<td>24%</td>
</tr>
<tr>
<td>5. More than 12 months</td>
<td>Responses 21</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Percent 15%</td>
<td>15%</td>
</tr>
<tr>
<td>Total Responses</td>
<td>142</td>
<td>142</td>
</tr>
<tr>
<td>Total Percent</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**RECRUITING & RETAINING:**

- **Placement Time Cycle:**
  - 77% (110) report a placement time cycle of 1 – 3 months
  - 11% (15) report 6 months or more
  - The most common factor listed as contributing to the length of placement cycle is the advertising, interviewing, reference checking and offer negotiations time requirements. (See appendix for all responses)
RECRUITING & RETAINING — CONTINUED

☐ Continuous Recruiting Process:
88% (125) report having NO process in place
(See individual groups for the programs utilized)
84% report having no plans to create a continuous recruiting process
(See appendix for other processes responses)

☐ Recruiting Sources: The recruiting sources used include:

☐ Newspaper Advertising 91% (129)
☐ Educational Institutions 61% (87)
☐ Employee Referrals 46% (65)
☐ Professional Assns/Publications 45% (64)
☐ The Internet 45% (64)
☐ Recruiting from other Government Agencies 43% (61)
☐ Recruiting from Private Firms 22% (31)
☐ Placement Agencies (Head Hunters) 13% (18)
(See appendix for other sources)

☐ Modifications to Hiring Process to Attract New Employees:
60% (85) have made NO modifications to their hiring process
37% (53) have made modifications to their process including

☐ Offered higher pay 29% (41)
☐ Lowered qualifications 16% (23)
☐ Created new classifications 13% (18)
☐ Hired at higher classification 11% (16)
☐ Eliminated exams 4% (5)
(See appendix for other modifications)

31. Employee Retention:
68% (96) report having NO specific programs designed to retain employees.
30% (43) have specific programs designed to retain employees
The programs utilized include the following:

☐ Paid higher education 23% (33)
☐ Exit interviews 22% (31)
☐ Flex time 21% (30)
☐ Routine salary/benefit comparisons 19% (27)
☐ Management training/coaching 18% (25)
☐ Employee satisfaction surveys 11% (15)
☐ Telecommuting 6% (8)
☐ Other Retention programs including
  Employee recognition, Employee/Management Committee
  & Wage adjustment bonuses 3% (4)
(See appendix for other retention programs)

32. Creating Retention Programs:
8% (11) report having plans to implement a programs designed to retain employees
All Responses

33. **For most organizations in today's economy, recruiting and retaining are major challenges. Please list three contributing factors you have observed as major roadblocks to recruiting and retaining:**
Seven major categories of contributing factors were reported — Salary & Benefits, Shortage of Candidates, Education, Competition for Employees, Recruiting Challenges, Location & Other. See individual groups for specific comments and appendix for all responses.

34. **Is there anything else you would like to add?**
See appendix for all responses.
APPENDIX

8. BENEFITS: ON TOP OF BASE SALARY WHAT OTHER BENEFITS ARE PROVIDED TO DEGREE CIVIL ENGINEERS?

• Paid holidays, Short & long term disability, Life ins., Flexible benefits plan, 401k
• Up to $2000/year and 40 paid hours for job related training; Disability Insurance (66%); 401K (Company 3%)
• Audio/Visual, Life Insurance, Cafeteria Plan, Short-term Disability
• Profit sharing
• Flexibility with work schedules
• Life and Disability Insurance
• Life & Disability Insurance
• Life Insurance
• Life Insurance ($10,000)
• Vehicle Allowance
• Vehicle allowance
• 401k Plan - match up to $500
• Section 125, $10,000 Life insurance, optional term life
• Cafeteria plan for benefits.
• Retirement is PERA (involves employee contribution).
• Vacation and sick leave benefits (27+ days per year).
• Pre-tax flex spending medical plan.
• 100% tuition reimbursement
• Vacation and Sick leave
• Paid time off
• Paid retirement and health insurance is partial only.
• Term Life Insurance
• Vacation & sick leave
• Short term disability
• Life Insurance
• Longevity
• $10,000 Life Insurance
• Medical and childcare pre-tax reimbursement, addl. term life insurance

19. BENEFITS: ON TOP OF BASE PAY WHAT OTHER BENEFITS ARE PROVIDED TO CIVIL ENGINEERING TECHNICIANS/SURVEYOR TECHNICIANS?

• Paid holidays, Short & long term disability, Life ins., Flexible benefits plan, 401k
• Profit sharing (2)
• Audio/Visual, Life Insurance, Cafeteria Plan, Short-Term Disability
• Up to $2000/year and 40 paid hours for job related training; Disability Insurance (66%); 401K (Company 3%)
• Life and Disability Insurance
• Life & Disability Insurance. Boot allowance.
• Life Insurance ($10,000)
• Life Insurance
• Life Insurance
• College credit, training
• Mileage & Classes
• Section 125, $10,000 Life insurance, optional term life
• Vacation and Sick leave (2)
• Life Insurance (2)
• Paid time off
• Paid retirement and health insurance is partial only.
• Term Life Insurance
• Short term disability
• Longevity
• $10,000 Life Insurance, Safety boots, Safety glasses, Clothing allowance

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25. WHAT ARE TWO MAJOR FACTORS CONTRIBUTING TO THE LENGTH OF YOUR PLACEMENT TIME CYCLE:

Advertising, Interviewing & Offer Time:
- Following the hiring process which meets the requirements of certain agencies. The period of time required to advertise job openings.
- Interview scheduling & offer negotiation.
- The advertisement/notice process and the offer/acceptance/starting date.
- Posting requirement timeframe, and the interview/background process.
- First step would be through "in-house" posting (if applicable based on job requirements) which would required 10-15 days. If no acceptable candidates are identified, external advertisement would be placed and would require 30-45 days to complete extern
- Advertising, reviewing applications, etc., and Recruitment time
- Review applicants and coordinate interviews.
- Negotiations of starting pay/time
- Interview process & length of advertising
- Streamlined interview/application process & prompt selection
- Advertise time.
- Advancement within existing staff to new job before looking outside the organization.
- Publication of advertisement and Scheduling interviews.
- Advertising & interview scheduling
- Define recruiting process: search laws
- Formal approvals and Advertising
- Advertising, background checks, interviews.
- Advertising & interviews.
- Posting/advertising time. Coordinating/scheduling interviewing time.
- Interview process
- Interview schedule & council agendas
- Interview requirements, background checks
- Time needed for advertising & interviewing
- Advertising & interview
  2. Two to three weeks of advertising, one week to review applicants and set up interviews, one week to interview, one to three weeks to get board approval to hire candidate.
  3. Posting timelines, testing process, pre-employment physical
  5. Wait for employee as notice was given.
  6. Hiring process details - such as printing applications. Advertisement.
  7. Background & references.
  8. Testing & background checks
  9. Weekly official newspaper
  10. Time involved to get permission to fill position; length of time to advertise and conduct interviews.

Lack of Candidates:
- Finding people with the required skills/experience; and the fact that they are being so heavily recruited by other companies and government agencies.
- Unavailability of qualified people. Competition from other employers.
- Most are relocation, so it takes time to get them here for an interview and time restraints on Department Heads
- Extremely low unemployment levels in professional areas, and limited numbers of survey candidates eligible for licensing in Minnesota.
- The biggest factor I have encountered is the time of the year. Recruiting blackout periods are in the summer and during the Christmas holiday season.
- Lack of qualified candidates
- Lack of qualified applicants
- Availability of talent and work loads of interviewer
- Lack of suitable candidates

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Appendix

--Lack of Candidates — continued
• Lack of interested/qualified applicants, can't compete with private sector salaries?
• Quality of applicants- occasional re-advertising
• Lack of applicants.
• Few qualified candidates.
• Tight job market.
• Availability of qualified applicants
• Lack of qualified applicants
• Lack of applicants due to salary scale
• Getting qualified candidates in the file. Salary.
• Finding qualified people. Trying to make an attractive offer.
• Lack of civil techs.
• Qualified applicants.
• Availability of qualified candidates
• Availability of qualified candidates & the need to be more timely in recruiting.

Public Process Requirements:
• Public notice
• Bureaucratic red tape
• Civil Service process & rules.
• Council meeting dates.
• The process we must observe because we are a local government agency takes more time than private industry.
• Getting through the board approval/personnel office process.
• Process & time

Other:
• Reviews
• Shortage in Human Resources
• Staff time available.
• Legal requirements.
• HR staff time constraints, process needs.
• HR staff time. Scheduling difficulties.
• Type of position being offered.
• Internal workload.
• Salary, Benefits
• Salary too low. Location - Northwestern Mn
• Pay scale and location
• Pay scale and housing
• Salary & location
• Unavailability of people willing to live here. Wages.
• Union
• Low wage and HR
• Turnover in our HR department
• Having candidates meet with multiple staff and customer groups. It is such a participative process.
• Diversity quota requirements and documentation.

26. DOES YOUR ORGANIZATION HAVE A CONTINUOUS ENGINEER/TECHNICIAN RECRUITING PROCESS IN PLACE? OTHER:

• Intern program
• Transportation Career Fair and Job Expo which is held in February of each year.
• Recruiting team concept that employs a competency-based interview process. We also have empowered the teams to make contingent job offers to candidates.

28. WHAT RECRUITING SOURCES DOES YOUR ORGANIZATION TYPICALLY UTILIZE?

• Yes, a cross-training program for younger techs.
• Job service
• Student chapters of professional associations. We also hire many students and we see these as potential candidates for FT jobs in the future.

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Appendix

30. IF YES, WHAT MODIFICATIONS HAVE YOU MADE OR ARE YOU MAKING TO ATTRACT NEW EMPLOYEES? OTHER:

- Have used cash bonuses as an incentive.
- Increased benefits & vacation.
- Hire at mid salary range instead of starting salary.
- Hiring bonus
- Forgiving or paying college loans
- Competency-based interview process & on-the-spot job offers

31. DOES YOUR ORGANIZATION HAVE SPECIFIC PROGRAMS DESIGNED TO RETAIN EMPLOYEES? OTHER:

- Interview with new hires at 3 months and 6 months to help with assimilation
- Employee - Management Committee
- Employee recognition.
- Just starting a Telecommuting program
- Money available for training outside of work

33. FOR MOST ORGANIZATIONS IN TODAY'S ECONOMY, RECRUITING AND RETAINING ARE MAJOR CHALLENGES. PLEASE LIST THREE CONTRIBUTING FACTORS YOU HAVE OBSERVED AS MAJOR ROADBLOKES TO RECRUITING AND RETAINING:

Salaries & Benefits:
- Low starting salaries for Civil Engineers in comparison to other engineering fields that reduce the number of young entrants into the field.
- Escalating salaries and benefits offered by others to attract our staff
- Lack of qualified applicants
- Shrinkage of the salary range between entry level technicians and experienced technicians and engineers
- Competitive salaries
- Pay
- Influence wage packages.
- Competitive salary & benefits.
- Difficulties with officials in increasing compensation.
- Lack of benefits, health payments and lack of paid dental.
- Salaries are raised when consultant bills get higher than staff costs.
- Benefits/salary are above average for local, private business.
- Low wages in our organization.
- Compensation (vs. private).
- Attitude that tech jobs don't warrant better compensation than special and legal jobs.
- Lower wages for public employees
- Lack of incentives/flexibility for supervisor to implement
- Math/Science people gravitate to better paying jobs (currently, computer science related).
- Hard to compete with the competition/flexibility of pay of private sector
- Inflexible pay/benefit plan of our government agency.
- Salary cap for small cities - hard to compete with the salaries paid by larger cities.
- Staying competitive with salaries once in union.
- Pay scale
- Pay limitations
- Requirement of "Equitable wages", limiting variances to pay policies
- Low wages.
- Pay rate - Council unwilling to pay "metro rates" in ring community
- Rising salaries
- City pay is lower than other organizations.
- Minimum other benefits offered.
- Lack of ability by governmental to offer incentives
- Wages
Appendix

Salary & Benefits — continued
• Salary is a major issue. Technicians are continually leaving for higher paying jobs.
• Salary. Starting salary of 80% of normal salary for that position (in union contract). No provision to hire new employees at a higher wage if there is a recruitment problem.
• Salary competition can lead to a dangerous spiral effect and is no guarantee of retention. Organizations must learn to think "outside the box" by looking at unconventional methods. First what are work needs; are there other means or ways of addressing them
• Low pay for technicians compared to other jobs like in the computer field.
• Technician pay is held down in union contracts since union membership is dominated by highway maintenance men.
• Pay systems do not allow for job market changes/shortage of qualified people does not affect pay scale.
• Benefits for insurance and vacation - everyone gets the same benefits like vacation when they start. There is no recognition for years of service with another employer.
• Low Wages
• Limited salary levels. Limited budget
• Pay scale. Benefits.
• County Admin views recruiting as being discriminatory. Absence of incentives to offer candidates. Wages and benefits are competitive.
• Lower pay than urban counties
• Salary. Vacation time
• Salary (2)
• Pay rate
• Established salary ranges not within market salaries. Potential internal pay inequities of hiring outside candidates at pay levels higher than current employees.
• Vacation schedule: no credit for outside employment and years of experience
• Salary, Benefits, Longevity
• Lower starting pay
• Salary & benefits.
• Our current salary schedule
• Pay
• Comparable worth plan doesn't allow competitive salaries
• Pay scale. Benefits
• Salary & location
• Uncompetitive salaries and benefit packages county boards are willing to pay
• Existing employees leaving positions to go to a larger county who is willing to pay the wage.
• Pay & benefits
• Competitive pay.
• Fixed rate of pay in government job classes. No flexibility to offer different kinds of fringe benefits. Cost of health insurance.
• Low wages.
• Comparable worth with other county employees.
• Low market based pay. Tech employees are rated in county comparable worth studies low due to male dominance in these positions.

Shortage of Candidates:
• Not enough available talent.
• Kids are not pursuing civil engineering as other professions have more appeal.
• Nobody available
• Low unemployment. (2)
• Small number of graduate civil engineers.
• Shortage of candidates for the positions.
• Other new fields of employment in the computer world which are higher paying jobs.
• Lack of "pool" of candidates.
• Strong labor market.
• Job market is tight - not enough qualified people.
• Low unemployment.
• Competitive job market means fewer applicants and higher compensation required.
• Additional funding for public works projects is occurring creating demand for engineers and technicians to design and inspect projects.
Shortage of Candidates — continued

- The supply of engineers is insufficient to meet demands. Therefore, no matter what is done, some companies
  are going to experience recruiting/retaining difficulties.
- Lack of experienced personnel and applying for higher level tech openings.
- Lack of qualified candidates. (2)
- Shortage of qualified/experienced workforce.
- Getting qualified staff.
- Career field
- Lack of strong work force
- Hard to find closely related experience to job needs.
- High demand for Technicians, low supply.
- Low supply of qualified engineering techs
- Lack of people entering the profession with an increased demand for our services. Computer jobs are popular
  and well paying, so people are attracted to those professions.
- Lack of qualified applicants, low pay, good economy, other places to work for.
- Available candidates
- Lack of qualified people
- There is a real shortage of qualified, experienced technicians.
- Shortage (2)
- Limited number of students going into field. Because of shortage, larger counties and consultants lure away
  people with larger salaries.
- Technical qualifications
- Lack of people
- Lack of qualified people to recruit for their positions
- No qualified candidates.
- There seems to be a lack of interest in this profession. The work doesn't appeal to young people. There is great
  competition from private companies.
- Shortage of qualified applicants.
- Lack of people available for these positions; not enough new employee candidates taking up the profession.
- Labor market for civil techs
- Employee market.
- Lack of qualified people.
- Not enough people enter this field.
- Shortage of civil engineers and techs.

Education:
- Poor integration of the academic community with the professional community.
- Lack of civil programs in technical schools.
- Lack of a statewide organized and coordinated effort by the transportation industry to educate "home grown"
  residents at the high school level on our careers in transportation.
- Lack of understanding of the work that technicians/engineers do, the locations of the jobs, and the pay scales.

Competition for Employees:
- Extreme competition from private industry.
- Competition
- Competition from other companies and government agencies
- Heavy recruiting by other companies/agencies
- Competition for available labor sources
- Lack of qualified candidates willing to work for government vs. private sector.
- Competition from private sector.
- Our relatively small organization can't compete with larger organizations/private sector for salaries, and cities
  can no longer boast that their benefits are superior. Because of our size and small number of positions, we
  don't have the flexibility to h
- Private consulting firms are able to structure better offers and counter-offers than union (gov't) positions.
- Private firms have better opportunity for advancement.
- Competition from private firms.
- Private firms have better training programs for new technology. Gov't is slow to keep up with technology
  advancements.
Appendix

Recruiting Challenges:
• Outstate counties can't compete with metro.
• Identifying advertising sources for professional and technical positions.
• Time/Lack of time for recruiting/hiring process
• A dilution of recruitment mediums (i.e. the dot coms have spread out the candidates that all used to look in the newspaper
• Lengthy and complex HR processes
• The issue in the past was the outdated methods that were used previously with recruiting. The fact that we did only information recruiting and were not in a position to extend job offers was a major disadvantage. We have since modernized our recruiting methods to be more in line with private sector.
• Inflexibility of our organization in regard to offering incentives for recruitment.
• Market will reward good engineering with follow-up work or recognize correcting work.
• Little or no chance for advancement.
• Recruiting - getting qualified personnel to apply.
• Retaining - Hard to retain when government doesn't keep up with market wages.
• Workplace relations (morale).
• Employee development practices.
• Long government process
• Engineering technician jobs are not as "glamorous" as others. Even thought there is desirable outside work there are long hours including weekends.
• At this point in time, I have not had difficulty recruiting and retaining.
• Retaining will be a problem soon due to salary.
• No effort to retain employees.
• Lack of advancement opportunities.
• Limited advancement opportunities.
• Having to fill vacant positions & descriptions versus being able to identify position description.

Location:
• Location we are in a rural setting with the total County population of 6,000 people.
• Geographic location of employment - rural areas pay less and have less to offer younger people.
• Rural community
• Job location
• Rural area: Techs would rather stay in Cities.
• Location (2)
• Remoteness of county. Affordable housing. Family can't make a living, job scarcity. Climate.
• Location in small community.
• Local economic conditions. County has high cost of living due to tourist/seasonal economy.
• Rural area.
• Unwillingness to life in small community.
• Rural area, not a large population base
• Weak farm economy and plant lay-offs.

Other:
• Cost of living in our area
• A different attitude of candidates (one that shows that they are in the drivers seat)
• Cost
• Uncertainty of and instability in funding levels in the future which increases our risk when we staff-up.
• Job stress and individuals wanting a higher quality work life.
• Mobility requirements.
• Nature of work in Federal Government.
• We haven't really had a problem in our city.
• Living outstate when most high-tech employees would prefer to work in the metro area
• Funding limitations
• Work day longer in small offices - necessary to work weekends and work when contractors work.
• Housing not as available in small cities as available in large cities - same with selection.
• Outstate location near lake/recreation area while located on I94 are problems.
Appendix

Other — continued.
• More difficult to work with citizens.
• Key is to keep competent workers.
• Our location on outer edge of Metro.
• Unions at City (most applicants aren't interested in unions).
• Again, the process we must observe is very rigid and time-consuming. We cannot bend the rules to speed up
  the process.
• No recruiting in 8 years.
• Work ethic
• Ability for spouse to find a job in our area
• Process too long
• County Board funding.
• HR
• WORKLOAD.
• Consultants higher paid

34. **IS THERE ANYTHING ELSE YOU WOULD LIKE TO ADD?**

• Minnesota needs a statewide coordinated recruitment plan that compliments and supports each local and state
  agency in educating the "home grown" on careers in transportation.
• We can't stop the industry competition for good candidates and quality personnel. However, as an industry, I
  hope that we can work together to create the demand and the supply we need. Lets creatively define
  strategies and distinctive roles to address t
• There is an absolute need for all public sector employers to modernize in order to remain competitive.
• Our City budgeted to hiring a civil engineering intern for the summer months. A job description was written to
  give the successful applicant a broad experience in municipal work. The job description was sent to 2 major
  civil engineering colleges, and
• Where are all the young technicians coming out of school going?
• We need to attract more bright, young people into civil engineering /tech schools!!
• Our county has been fortunate in hiring the last two technicians as one married a girl from this area and the
  other tech's wife had a good job here. Obtaining qualified applicants was very difficult at one time.
• Technical fields other than civil are more attractive and rewarding to students planning their careers.
• We are a small organization and we desire people with experience. We do not have the luxury of long training
  programs.
• Don't use colors/shading on fax messages because they don't work; they eat up tele time.
• I don't like the format for parts of this survey.
• Realistically there are better, financially compensating careers than transportation in this economy.
• We need more training facilities for techs - I suppose we first need more interested students.
• Summer engineering help is getting difficult to find.
Employer Workforce Survey
June 14, 2000

1. What type of organization do you represent?
   o Private Consulting Firm
   o City Govt
   o County Govt
   o Other
   If "Other", please specify below:

**Degreed Civil Engineers -**
2. How many degreed Civil Engineer positions does your organization currently have?
   If you answered "None", skip to question 13.
   o None
   o 1-5
   o 6-10
   o 11-20
   o More than 20

3. Of those employed as degreed Civil Engineers in your organization, what demographic categories are represented? (Mark all that apply)
   o Caucasian Men
   o Minority Men
   o Women
   o Non U.S. Citizen

4. How many new, additional degreed Civil Engineer positions will your organization need in the next five years?
   o None
   o Less than 5
   o 5-10
   o More than 10

5. How many Civil Engineers currently employed in your organization are scheduled for retirement in the next 5 years?
   o None
   o 1-5
   o 6-10
   o 11-20
   o More than 20

6. What is the lowest entry-level base salary that you are currently paying a degreed Civil Engineer in your organization?
   o Less than $30,000
   o $30,000 - $34,999
   o $35,000 - $39,999
   o $40,000 - $44,999
   o $45,000 & over

7. What is the highest base salary that you are currently paying a degreed Civil Engineer in your organization?
   o Less than $40,000
   o $40,000-$49,999
   o $50,000-$59,999
   o $60,000-$79,999
   o $80,000-$99,999
   o Over $100,000
Employer Workforce Survey

8. Benefits: On top of base salary what other benefits are provided to degree Civil Engineers? Mark all that apply.

- Bonuses/Merit
- Vehicle
- Paid Retirement Plan
- Health Ins
- Dental Ins
- Other

If "Other", please specify below:

9. Vacation: How many vacation days are offered to newly hired degree Civil Engineers by the end of their second year of employment?

- 5 days or less
- 6 - 10 days
- More than 10 days

10. How many unfilled degree Civil Engineer positions does your organization currently have due to recruitment challenges?

- None
- 1-5
- 6-10
- 11-20
- More than 20

11. Does your organization use outside consultants to temporarily cover the Civil Engineer positions you are attempting to fill?

- Yes
- No
- Not Applicable

12. What is the longest time a degree Civil Engineer position has gone unfilled in your organization over the last two years due to recruitment challenges?

- Less than 1 month
- 1 - 3 months
- 6 - 12 months
- More than 12 months

Civil Engineering Technicians/Surveyor Technicians -

13. How many Civil Engineering Technician/Surveyor Technician positions does your organization currently have?

If you marked "None", skip to question 24.

- None
- 1-5
- 6-10
- 11-20
- More than 20

14. Of those employed as Civil Engineering Technicians/Surveyor Technicians in your organization, what demographic categories are represented? (Mark all that apply)

- Caucasian Men
- Minority Men
- Women
- Non U.S. Citizen

15. How many new, additional Civil Engineering Technician/Surveyor Technician positions will your organization need in the next five years?

- None
- Less than 5
- 5-10
- More than 10

16. How many Civil Engineering Technicians/Surveyor Technicians currently employed in your organization are scheduled for retirement in the next 5 years?

- None
- 1-5
- 6-10
17. What is the **lowest entry-level base pay** that you are currently paying a Civil Engineering Technician/Surveyor Technician in your organization?

- Less than $10 per hr
- $10-$14.99 per hr
- $15-$19.99 per hr
- Over $20 per hr

18. What is the **highest base pay** that you are currently paying a Civil Engineering Technician/Surveyor Technician in your organization?

- Less than $15 per hr
- $15-$19.99 per hr
- $20-$24.99 per hr
- Over $25 per hr

19. **Benefits**: On top of base pay what other benefits are provided to Civil Engineering Technicians/Surveyor Technicians? Mark all that apply.

- Bonuses/Merit
- Vehicle
- Paid Retirement Plan
- Health Insurance
- Dental Insurance
- Other

   If "Other", please specify below:

20. **Vacation**: How many vacation days are offered to newly hired Civil Engineering Technicians/Surveyor Technicians by the end of their second year of employment?

- 5 days or less
- 6 - 10 days
- More than 10 days

21. How many **unfilled** Civil Engineering Technician/Surveyor Technician positions does your organization currently have due to recruitment challenges?

- None
- 1-5
- 6-10
- 11-20
- More than 20

22. Does your organization use **outside consultants** to temporarily cover Civil Engineering Technician/Surveyor Technician positions you are attempting to fill?

- Yes
- No
- Not Applicable

23. What is the **longest time** a Civil Engineering Technician/Surveyor Technician position has gone unfilled in your organization over the last two years due to recruitment challenges?

- Less than 1 month
- 1 - 3 months
- 6 - 12 months
- More than 12 months
Employer Workforce Survey

Recruiting & Retaining -
24. Placement time cycle: On average, how long does the placement process take in your organization for a candidate to go from the first posting/advertisement to a position offer?
   o Less than 1 month
   o 1 - 3 months
   o 6 - 12 months
   o More than 12 months

25. What are two major factors contributing to the length of your placement time cycle:

26. Does your organization have a continuous engineer/technician recruiting process in place?
   o Yes
   o No

   If Yes, what of the items listed on the right do you utilize? Mark all that apply.
   If "Other", please specify below:
   o K-12 Programs
   o College/Tech School Programs
   o Job/Career Fair
   o Scholarship Programs
   o Routine Information Sessions
   o On-the-spot Job Offers
   o Employee Referrals
   o Other

27. If no, is your organization currently creating a continuous engineer/technician recruiting process?
   o Yes
   o No
   o Not Applicable

28. What recruiting sources does your organization typically utilize? Mark all that apply.
   If "Other", please specify below:
   o Newspaper Advertising
   o Placement Agencies (Head Hunters)
   o Professional Assns or Publications
   o The Internet
   o Educational Institutions
     Recruiting from other Govt Agencies
   o Recruiting from other Private Firms
   o Employee Referrals
   o Other

29. Have you made modifications to your normal hiring process to attract new employees?
   o Yes
   o No

30. If yes, what modifications have you made or are you making to attract new employees?
   Mark all that apply
   o Offered higher pay
   o Hired at higher classification
   o Created new classifications
   o Eliminated exams
   o Lowered qualifications
   o Other
Employer Workforce Survey

If "Other", please specify below:

31. Does your organization have specific programs designed to retain employees?

If Yes, select the key elements of your program from the choices on the right. Mark all that apply.

- Employee Satisfaction Surveys
- Management Training/Coaching
- Paid Higher Education
- Routine Salary/Benefit
- Comparisons
- Flexible Time
- Telecommuting
- Exit Interviews
- Other

If "Other", please specify below:

32. If no, is your organization currently creating programs designed to retain employees?

- Yes
- No
- Not Applicable

33. For most organizations in today's economy, recruiting and retaining are major challenges. Please list three contributing factors you have observed as major roadblocks to recruiting and retaining:

34. Is there anything else you would like to add?
APPENDIX D
Best Practices
Minnesota Summit on Civil Engineering Workforce Development
Best Practices Summary

During 1998 and 1999 the New Mexico State Highway and Transportation Department, in cooperation with the Federal Highway Administration, conducted the "Staffing Plan Survey of State Transportation Agencies". The survey examined the issues and practices of state transportation agencies around recruitment, right-sized workforce, flexible workforce, retention and succession planning. The chart below summarizes, by workforce development factor, which states have innovative applications, and the states interested in collaborating with others in the factor.

<table>
<thead>
<tr>
<th>Workforce Development Factor</th>
<th>States Reporting Innovative Applications of this Factor</th>
<th>States Interested in Collaborating on this Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recruitment</strong></td>
<td>AR, DE, FL, IN, IA, LA, ME, NH, NJ, NY, NV, SC, TX</td>
<td>AL, AK, AZ, CA, CO, DE, FL, GA, ID, IN, IA, KS, KY, LA, ME, MD, MI, MN, MO, MT, NE, NV, NH, NJ, NM, NC, OR, PA, RI, SC, SD, TN, TX, UT, VT, WA, WV, WI, WY</td>
</tr>
<tr>
<td><strong>Right-sized workforce</strong></td>
<td>AR, CA, CO, KY, MD, MI, MO, NM, PA, SC, SD, VT, VA, WI</td>
<td>AL, AK, AZ, CA, CO, DE, FL, GA, ID, IN, IA, KS, KY, LA, MA, ME, MD, MI, MN, MS, MO, MT, NE, NV, NH, NM, NJ, NY, NC, OR, PA, RI, SC, SD, TN, TX, UT, VA, WA, WV, WI, WY</td>
</tr>
<tr>
<td><strong>Flexible workforce</strong></td>
<td>DE, ID, IN, IA, KY, MN, MT, WY</td>
<td>AL, AK, AZ, DE, FL, ID, IA, KS, KY, ME, MD, MA, MI, MO, MT, NE, NV, NH, NJ, NM, NC, OH, OR, PA, RI, SC, TN, TX, UT, VT, WA, WV, WI</td>
</tr>
<tr>
<td><strong>Retention</strong></td>
<td>AR, AZ, CA, DE, FL, IN, IA, KY, LA, ME, MD, MA, MN, MS, MO, MT, NY, NC, OK, RI, SC, UT, VA, WV, WI</td>
<td>AL, AK, AZ, CA, CO, DE, FL, GA, ID, IN, IA, KS, KY, LA, ME, MD, MI, MN, MO, MT, NE, NV, NH, NJ, NM, NC, OR, PA, RI, SC, SD, TN, TX, UT, VT, WA, WV, WI, WY</td>
</tr>
<tr>
<td><strong>Succession planning</strong></td>
<td>CO, IN, MA, MI, MO, MN, NJ, NY, OR, SC, WV</td>
<td>AL, AZ, CA, CO, DE, FL, ID, IN, IA, KS, KY, LA, ME, MD, MI, MN, MO, MT, NE, NV, NH, NJ, NM, NY, NC, OR, PA, RI, SC, TN, TX, UT, VA, WA, WV, WI, WY</td>
</tr>
</tbody>
</table>

D-1
Minnesota Summit on Civil Engineering Workforce Development
Best Practices Summary

F/DOT: “Professional Engineer Training Program”
Process(es): Recruitment, Retention (training and development)

The purpose of the Professional Engineer Training Program is to “provide graduate engineers with broad, practical experience in the field of transportation engineering, leading to registration as a licensed professional engineer in the State of Florida. The secondary purpose is to provide training in management and supervisory techniques to prepare the Trainee for the management and administrative function within the Department.”

F/DOT sends their engineers to universities and colleges to recruit for this program. The program is organized in two phases:
Phase One – Phase One is the Engineer Training Program which is a 24 month rotation exposing the trainee to all the key highway engineering functions.
Phase Two – Graduates of phase one participate in a 24 month internship with FL/DOT to become a Senior Engineer. Trainees gain experience in both technical and managerial responsibilities.

Each trainee is assigned a Phase Supervisor who is responsible for mentoring the trainee and monitoring their progress. The Phase Supervisor develops an On-the-Job Training Plan for the trainee. Each trainee is evaluated by the Phase Supervisor using the Trainee Rating form at six, twelve, and eighteen month intervals. Performance evaluation ratings are tied to incremental salary increases. Additionally, trainees must pass a written examination in five areas of the rotational program.

Eligibility and Recruitment – An engineer trainee candidate must meet the following criteria: hold a Bachelor of Civil Engineering or BS in Civil Engineering from an ABET institution, be a U.S. citizen, be registered to take the Engineer-In-Training (EIT) examination. Candidates are recruited by the state PE Training Coordinator or by managers in the districts.

Contact Person:
Walt Mitchell
Asst. Director – Personnel
Florida DOT
605 Suwannee
MS 605
Tallahassee, FL 32399-0450
(850) 414-5322

Source Document(s):
Professional Engineer Training Program Procedure Manual

AL/DOT: College Outreach
Process(es): Recruitment of professional engineers

AL/DOT maintains an extensive database of students enrolled in engineering programs at colleges and universities in the southeastern states. AL/DOT engineers make recruiting and outreach visits to all the major colleges and universities in the southeastern states. Relationships are cultivated with professors at these schools.

FE and PE exam preparation materials (including study guides and videos) are made available to students sitting for those exams.

Contact Person:
Curtis Pierce
Bureau Chief, Professional Engineering Education and Development
Alabama DOT
1409 Coliseum Blvd.
Montgomery, AL 36110-3050
(334) 242-6329

Source Document(s):
Bureau Manual
## Minnesota Summit on Civil Engineering Workforce Development
### Best Practices Summary

**V/DOT: Employee Recognition Program**
**Process(es):** Retention (recognition)

This program is designed to increase retention of agency employees by extending recognition in three forms: formal, planned and immediate. *Formal recognition* is high profile, annual events which recognize time in service, participation in employee suggestion program, or the employee of the year. *Planned recognition* is less formal but more frequent recognition opportunities that recognize special performance in such areas as safety, customer service, and productivity. *Immediate recognition* is given at any time in appreciation for an employee displaying teamwork, special effort or generating improvement ideas.

Awards are a mix of monetary, non-monetary (trips, plaques, certificates, prizes, etc.) and leave. Leave (up to 5 days) must be used within 12 months after being awarded. The agency may choose to give the employee the dollar value of the leave if they are unable to give the employee the time off.

**V/DOT: Compensation Reform**
**Process(es):** Retention (compensation)

Intended to give VDOT managers greater flexibility and offer higher salaries. Highlights of the reforms are:

<table>
<thead>
<tr>
<th>Pay Practice</th>
<th>Old Guideline</th>
<th>Reform Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting pay</td>
<td>Negotiable from minimum of pay grade up to 10% above current salary. Exceptions higher than 10% may be granted as appropriate at agency discretion.</td>
<td>Negotiable from minimum of pay grade up to 15% above current salary. Exceptions higher than 15% may be granted as appropriate at agency discretion.</td>
</tr>
<tr>
<td>Promotion</td>
<td>Non-negotiable, 9.3% above current salary or to the minimum of the higher salary grade for 1 to 2 salary grade change.</td>
<td>Negotiable from minimum of new pay band up to 15% above current salary. Salary may not be below the minimum of the new pay band.</td>
</tr>
<tr>
<td>Voluntary Transfer</td>
<td>No salary increases permitted.</td>
<td>Negotiable from minimum of pay band up to 15% above current salary not to exceed pay band maximum.</td>
</tr>
<tr>
<td>Voluntary Demotion</td>
<td>Starting pay policy, not to exceed employee's current salary.</td>
<td>Negotiable from minimum of pay band up to current salary not to exceed pay band maximum. Agency option to freeze salary above maximum for 6 months.</td>
</tr>
<tr>
<td>Temporary Pay (assuming new duties on a temporary basis)</td>
<td>Limited generally to 6.9%</td>
<td>0-15% above current salary not to exceed pay band maximum.</td>
</tr>
<tr>
<td>Competitive Salary offer</td>
<td>Match outside offer not to exceed maximum of salary grade</td>
<td>Match outside offer not to exceed maximum of pay band</td>
</tr>
</tbody>
</table>

**Contact Person:**
Patricia Baunguss  
Human Resources Administrator  
Virginia/DOT  
(804) 371-6790

**Source Document(s):**
| Mn/DOT: Best Practices Study | Contact Person:  
Process(es): Recruitment and Selection, Retention, Training and Development, Strategic Staffing  
Theresa Johnson  
Asst. Staffing Manager  
Office of Human Resources  
MS 200  
395 John Ireland Blvd.  
St. Paul, MN 55155-1899  
(651) 296-4134 |
|----------------------------------|---------------------------------------------------|
| This extensive study, conducted by a Mn/DOT project team, examines the Mn/DOT workforce and documents various best practices from public organizations and industry. The best practices are interpreted as specific recommendations for Mn/DOT to implement by short-term (1-6 months) and long-term (more than 6 months) actions. While some recommendations are highly specific to Mn/DOT most have broad application and are potentially useful at the county and city levels. | Source Document(s):  
"Program Delivery Initiative: Recruitment and Selection. Final Report April, 1999" |

| AL/DOT: Engineering Assistants Recruiting Outreach Program | Contact Person:  
Process(es): Recruitment of technicians  
Cleo Daniel  
Recruiter  
Alabama DOT  
1409 Coliseum Blvd.  
Montgomery, AL 36130-3050  
(334) 242-6334 |
|----------------------------------------------------------|---------------------------------------------------|
| AL/DOT has a staff of 6 full time recruiters who go into community colleges and high schools to promote engineering assistant as a career option for students. The recruiters are augmented by 25 engineers working out of 9 district offices who also work in the schools. When a student shows interest their name is sent to the Montgomery office, entered into a data base for tracking and an information packet is issued to the student. The packet contains a document describing the position, the examination process and how to apply. The original examination used for this position was found to be racially discriminatory and a racially neutral version is being developed. Consequently, copies of the exam are not now available. | Source Document(s):  
See summary. |
APPENDIX E
Civil Engineering Workforce Development Model
WORKFORCE DEVELOPMENT MODELS

Purpose

A model is any simplified representation of a complex system or process. It allows those who work in the system to view it in its most

There are two models we will examine in today’s Summit. First, a generic model of workforce development which could apply to any public or private labor market. Each organization will have its own peculiarities and needs not captured by this model, but it still provides a means to examine the major components of the system that are common to all workforce development efforts. The major components of the model are:

A. Workforce Recruitment (attracting and hiring the best and brightest)
   1. Traditional labor market
   2. Non-traditional labor market

B. Workforce Retention (keeping and growing the best and brightest)
   1. Work/Life Programs
   2. Training, Development and Education
   3. Flexible work Systems
   4. Success Sharing

The second model is specific to the Civil Engineering profession and contains greater detail on the labor market it draws on. Our research found that there are four major components to the Civil Engineering model:

A. Awareness, Attraction, Accessibility (the 3 As)

The targets of this component of the model are individuals who are forming career direction decisions or making career change decisions. Students in high school and college, and even elementary, need to be aware of the profession and the path to entry and attracted to its benefits. Accessibility is about how to make learning about the profession within reach for decision makers. Accessibility deals with such things as internships, job shadowing, scholarships, and school entrance processes.

B. Recruiting

Recruiting is the systematic identification, tracking and persuasion of individuals who meet the requirements of your organization. Recruiting is much more than screening out the undesirable candidates. It is much more about marketing your organization to candidates who have many options open to them. Recruiting needs to be viewed not as “filling a position” but as hiring a person. Jobs will come and go, but the need for bright, skilled employees will only grow.
C. Retention / Redesign

Once the candidate becomes an employee the process is not over, only passed into a new phase of the relationship. High performing employees need reasons to stay, especially in the face of aggressive recruiting from your competitors. We know from research what makes employees stay; the top ten are:

1. Career growth, learning and development
2. Exciting work and challenge
3. Making a difference in their work
4. Working with other high performers
5. Being part of a team
6. A good boss
7. Recognition for their work
8. Fun on the job
9. Autonomy. A sense of control over their work
10. Flexibility, e.g. work hours, dress.

D. Re-recruiting

Given the rising number of retirees in the profession, civil engineering must find ways to re-recruit this population. That can be accomplished in a variety of ways ranging from part-time work, to consulting and teaching. Re-recruiting is also about capturing the rich knowledge held by retirees and making it available for working professionals.

How to Use the Civil Engineering Model

The Civil Engineering Model has many key decision points that potential and active civil engineering professionals can make. Those decision points are represented on the flow chart as diamonds. We can use those decision points as a focal point for devising strategies to influence those decisions in a way that furthers the development of the civil engineering workforce.
APPENDIX F

Workshop Agenda
TO: Civil Engineering Workforce Development Summit Participants  
FROM: Susan Henderson and Brad Brown, Henderson Associates  
RE: Summit Participants’ Preparation Packet  
DATE: July 31, 2000  

Thank-you for registering for the Summit. Your participation is vital to the quality of the outcomes we produce there. We have registered 47 participants from city, county and municipal governments; educators, consultants, and students. The broad cross-section of participants will give us an invaluable perspective on the issues.

As consultants our role has been to conduct research, organize the event and, on the day of the Summit, facilitate the proceedings.

Enclosed are some materials to help you prepare for the Summit. Enclosed you will find:

1. A welcoming letter from Dick Hansen.  
2. An agenda for the Summit  
3. Participant’s Pre-Summit Interest Survey Summary  
4. A white paper on workforce development entitled, “New Leadership for a New Workforce”  
5. A map of the route to Dunwoody Institute.

Each registrant will receive a three-ring binder containing the materials needed for the day to which you can add the enclosed materials.

We look forward to meeting each of you and a productive day.

Susan Henderson and Brad Brown

Enc.
July 31, 2000

Dear Civil Engineering Summit Participant:

Thank-you for committing your time and expertise as a participant in the upcoming Minnesota Summit on Civil Engineering Workforce Development sponsored by the Research Implementation Committee (RIC) of the Local Roads Research Board (LRRB). Members of the RIC and LRRB have been working toward the Summit for several months now and are very pleased with the number and diversity of registered participants.

Our overarching goals for this event are to (a) create a common understanding of the nature and scope of the problem we face together, and (b) develop a definitive action plan which collaboratively draws on the ideas and resources of all our stakeholders to solve that problem.

Please view this Summit not simply as a informational session, but as a “hands-on” working session in which you will be asked to apply your knowledge and experience to the creation of solutions with committed resources. The LRRB and RIC are strongly committed to facilitating the execution of the plan we develop during the Summit.

County and municipal engineers, through the RIC, have identified this topic as a high priority transportation issue. While broad agency needs and opportunities vary, the Summit provides a forum for sharing among transportation professionals, employers and educators. The resulting action plan will be a tool useful for all stakeholders – both individually and in partnership with others.

I look forward to working with you during the Summit and over the months ahead as we implement our shared plans.

Sincerely,

Dick Hansen

Chair, Minnesota Summit on Civil Engineering Workforce Development
Agenda

Introduction  9 – 9:20

Opening Remarks – Dick Hansen

Introductions

Agenda

Situation Analysis  9:20 – 12:00

Research Findings
A. The Changing Face of the Workforce
B. Employer’s Workforce Survey Key Findings
C. Best Practices from DOTs and other Industries

BREAK

A Civil Engineering Workforce Development Model

Panel Discussion

Participants’ Input
A. Define the Problem
B. Insights, Solutions and Possibilities

LUNCH

Vision and Action Planning  12:45 – 4:45

Vision – What is possible?

Action Plan Development
A. Planning Groups develop action plans by issue area

BREAK

B. Planning Group Presentation and Consensus Agreements

Action Plan Implementation
A. Solicit members for the Steering Committee / Work Groups
B. Post-Summit Next Steps

Closing  4:45 – 5:00

Closing Remarks

Participant Evaluation