APPENDIX D
Collated U.S. Survey Results

Collated U.S. Survey Results

for

NCHRP PROJECT 20-05, Synthesis Topic 40-04: Utility Location & Highway Design

Friday, January 15, 2010
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Executive Summary

This report contains a detailed statistical analysis of the results to the survey titled *Copy of NCHRP PROJECT 20-05, Synthesis Topic 40-04: Utility Location & Highway Design*. The results analysis includes answers from all respondents who took the survey in the 80 day period from Monday, February 02, 2009 to Thursday, April 23, 2009. Thirty-Seven (37) completed responses were received to the survey during this time.
Questions 1-5 were specific to individual state DOTs and are not part of this collated report

6) Which statement best describes your DOT’s philosophy on utilities?  
The official DOT response was:

![Pie chart]

RED: The utility company is responsible to know where they are located in my right of way  
GREEN: The DOT is responsible to know where all utilities are located in the right of way  
YELLOW: The DOT and the utility companies are equally responsible to know where the utilities are within the right of way.

However, within the DOT there was the following diversity of opinion to the official response.

![Pie chart]

RED: Survey takers are in complete disagreement  
GREEN: Survey takers are mostly in agreement  
YELLOW: Survey takers disagree somewhat  
BLUE: Survey takers are in complete agreement
7) Is your DOT philosophy to weigh the cost to both the utility ratepayer and the taxpayer when considering whether to design around or move utilities? (Mark all answers that apply.)

The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
8) Are there any state statutes or policies that affect your decision to relocate utilities versus design around utility conflicts? If yes, please give a brief description in the "Other" section.

The official DOT response was:

Other Responses:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>We are required to pay for municipally owned relocations.</td>
<td>32.4%</td>
</tr>
<tr>
<td>Clear zone issues</td>
<td>52.2%</td>
</tr>
<tr>
<td>Policy to avoid utility facilities whenever possible.</td>
<td>2.7%</td>
</tr>
<tr>
<td>manual, practical design, varied guidance documents</td>
<td>2.7%</td>
</tr>
<tr>
<td>We are working on a Public Interest Determination Policy that would most likely influence or change this answer</td>
<td></td>
</tr>
<tr>
<td>MDOT policy requires to pay for municipal utility relocation costs, not privately owned public.</td>
<td></td>
</tr>
<tr>
<td>It is our policy to design around utilities as practicable, insofar as this does not add to the cost borne by the state.</td>
<td></td>
</tr>
</tbody>
</table>
If the utility is located in accordance with the utility permit, the costs to relocate/adjust the facilities in conflict are generally a project cost per state statute.

If the state is required to bear the cost of the adjustment, it is easier to proceed with the first choice of highway design without as much consideration of the utility's ability to pay for the adjustment.

However, within the DOT there was the following diversity of opinion to the official response.

5.3) Question # 8

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Survey Takers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey takers completely agree</td>
<td>38.4%</td>
</tr>
<tr>
<td>Survey takers are mostly in agreement</td>
<td>40.9%</td>
</tr>
<tr>
<td>Survey takers disagree somewhat</td>
<td>18.2%</td>
</tr>
<tr>
<td>Survey takers are in complete disagreement</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement

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9) Are there any DOT policies or guidance documents that negatively affect your ability to consider whether to relocate utilities or design around them? If "yes" please give a brief description in the "Other" section.

The official DOT response was:

No. More of a scheduled letting deadline which restricts time to investigate and redesign to avoid utility conflicts identified in utility coordination (ROW plans Issuance) stage.

Municipal undergrounding ordinances come into play when more than 5 spans are involved.
However, within the DOT there was the following diversity of opinion to the official response.

5.4) Question 9 (This question is to be filled out only by the person responsible to collate answer)

- RED: Survey takers are in complete agreement
- GREEN: Survey takers are mostly in agreement
- YELLOW: Survey takers disagree somewhat
- BLUE: Survey takers are in complete disagreement

Survey breakdown:
- 40.9% agree
- 31.3% mostly agree
- 4.5% disagree somewhat
- 22.7% completely disagree
10) Where does your “Utility Section” fit within the overall DOT organization? (Mark all answers that apply.)

The official DOT response was:

Other Responses:

<table>
<thead>
<tr>
<th>Utility Engineering Group</th>
<th>Technical Services Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>central office-r/w, distr-project develop</td>
<td>Project Management</td>
</tr>
<tr>
<td>Program Development-design &amp; Planning</td>
<td>Planning and Project Development</td>
</tr>
<tr>
<td>part of ROW or stand alone -by region</td>
<td></td>
</tr>
</tbody>
</table>
However, within the DOT there was the following diversity of opinion to the official response.

5.5) Question #10 (This question is &nbsp; to be filled out only by the person responsible to collate answers)

- RED: Survey takers are in complete agreement
- GREEN: Survey takers are mostly in agreement
- YELLOW: Survey takers disagree somewhat
- BLUE: Survey takers are in complete disagreement
11) Is a member of the “Utility Section” designated to be part of the project design team?

The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
12) If Yes, at what point in the project development process do they have the first opportunity to get involved?

The official DOT response was:

- RED: Planning Stage
- GREEN: Topo Survey Stage
- YELLOW: Early Design
- BLUE: Mid-design
- WHITE: Late Design
- GRAY: Post Design/Pre-Construction
- PURPLE: Construction
- TEAL: Other

Other Responses:
- As early as Project Manager calls for >
- It depends on the project.
- responses varied significantly
- usually early design, sometimes planning
- 30% Design

However, within the DOT there was the following diversity of opinion to the official response.
13) Do you have designers on most projects that are trained in utility issues?

The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
14) If Yes, do they have training in the following areas? (Mark all answers that apply.)

The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.

Other Responses:

How to best use and optimize SUE; and through “hands-on” experience

The utility section has these skills - not the designer
15) How do you get utility information on design plans?

The official DOT response was:

- Department personnel obtain and use utility records
- Utility Companies get set of design plans and draw utilities on it
- Department personnel survey "construction one-call marks"
- Consultant surveys "construction one-call marks"
- Department personnel survey "design one-call marks"
- Consultant surveys "design one-call marks"
- Hire subsurface utility engineering firm
- Not Sure

**COMPLETE QUESTIONS**

<table>
<thead>
<tr>
<th>Activity</th>
<th>All the time</th>
<th>Most of the time</th>
<th>About half of the time</th>
<th>Some of the time</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department personnel obtain and use utility records</td>
<td>0.0%</td>
<td>10.8%</td>
<td>13.5%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Utility Companies get set of design plans and draw utilities on it</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Department personnel survey &quot;construction one-call marks&quot;</td>
<td>2.7%</td>
<td>8.1%</td>
<td>16.2%</td>
<td>21.6%</td>
<td>29.7%</td>
<td>-</td>
</tr>
<tr>
<td>Consultant surveys &quot;construction one-call marks&quot;</td>
<td>2.7%</td>
<td>8.1%</td>
<td>16.2%</td>
<td>21.6%</td>
<td>29.7%</td>
<td>-</td>
</tr>
<tr>
<td>Department personnel survey &quot;design one-call marks&quot;</td>
<td>8.1%</td>
<td>16.2%</td>
<td>21.6%</td>
<td>27.0%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Consultant surveys &quot;design one-call marks&quot;</td>
<td>8.1%</td>
<td>16.2%</td>
<td>21.6%</td>
<td>27.0%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Department personnel survey &quot;cons ...</td>
<td>2.7%</td>
<td>16.2%</td>
<td>24.3%</td>
<td>32.4%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Utility Companies get set of desi ...</td>
<td>5.4%</td>
<td>24.3%</td>
<td>32.4%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Department personnel obtain and u ...</td>
<td>10.8%</td>
<td>13.5%</td>
<td>29.7%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Comment Responses:

- Sometimes poor compliance for marking
- UG utils loc by One-call & UT - DOT Surv
- wide spread across the feedback
- locates are obtained during design phase
- unable to comment on consultant actions

However, within the DOT there was the following diversity of opinion to the official response.

5.10) Question 115: This question is to be filled out only by the person responsible to collate answer

- survey takers completely agree on ...
- survey takers are mostly in agree ...
- survey takers disagree somewhat o ...
- survey takers are in complete dis ...

- 40.9%
- 31.8%
- 18.2%
- 3.1%
Here is the detailed response for each question asked in # 15.

15.1) Department personnel obtain and use utility records (How do you get utility information on design plans?)

15.1) Department personnel obtain and use utility records (How do you get utility information on design plans?)

- Never: 2.7%
- Rarely: 10.8%
- Some of the time: 18.9%
- About half of the time: 13.5%
- Most of the time: 29.7%
- All the time: 16.2%

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the time</td>
<td>6</td>
</tr>
<tr>
<td>Most of the time</td>
<td>11</td>
</tr>
<tr>
<td>About half of the time</td>
<td>5</td>
</tr>
<tr>
<td>Some of the time</td>
<td>7</td>
</tr>
<tr>
<td>Rarely</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
</tr>
</tbody>
</table>
15.2) Utility Companies get set of design plans and draw utilities on it (How do you get utility information on design plans?)

[Bar chart showing the frequency of utility information being included on design plans.]

- Never: 5.4%
- Rarely: 10.8%
- Some of the time: 24.3%
- About half of the time: 5.4%
- Most of the time: 32.4%
- All the time: 16.2%
15.3) Department personnel survey “construction one-call marks” (How do you get utility information on design plans? )

- Never: 24.3%
- Rarely: 21.6%
- Some of the time: 16.2%
- About half of the time: 2.7%
- Most of the time: 18.9%
- All the time: 13.5%
15.4) Consultant surveys “construction one-call marks” (How do you get utility information on design plans?)

15.4) Consultant surveys “construction one-call marks” (How do you get utility information on design plans?)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>24.3%</td>
</tr>
<tr>
<td>Rarely</td>
<td>13.5%</td>
</tr>
<tr>
<td>Some of the time</td>
<td>21.6%</td>
</tr>
<tr>
<td>About half of the time</td>
<td>8.1%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>21.8%</td>
</tr>
<tr>
<td>All the time</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

Legend:
- Red: All the time
- Green: Most of the time
- Yellow: About half of the time
- Blue: Some of the time
- Purple: Rarely
- Gray: Never
15.5) Department personnel survey “design one-call marks” (How do you get utility information on design plans?)

![Bar chart showing the frequency of getting utility information on design plans.]

- Never: 27.0%
- Rarely: 21.6%
- Some of the time: 8.1%
- About half of the time: 8.1%
- Most of the time: 24.3%
- All the time: 8.1%
15.6) Consultant surveys “design one-call marks” (How do you get utility information on design plans?)

- Never: 21.6%
- Rarely: 18.9%
- Some of the time: 16.2%
- About half of the time: 13.5%
- Most of the time: 24.3%
- All the time: 2.7%
15.7) Hire subsurface utility engineering firm (How do you get utility information on design plans?)

- Never: 21.6%
- Rarely: 21.6%
- Some of the time: 29.7%
- About half of the time: 16.2%
- Most of the time: 8.1%
- All the time: 2.7%
15.8) Not Sure (How do you get utility information on design plans?)
16) Do you have a formal mechanism to decide on which of the above methods you will use for a specific project? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
17) Do you consider the impacts of overhead utilities at a different time in the project development process than you do the underground utilities? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
18) Do consultant-designed projects follow the same procedures for obtaining utility information that the department does? The official DOT response was:

RED: They must follow the same procedures
GREEN: They have flexibility to obtain utility information any way they choose
YELLOW: They suggest a scope and then must receive permission from the Department for that scope

However, within the DOT there was the following diversity of opinion to the official response.

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement
19) Does your Contract Management policy enforce Errors & Omissions for utility data depicted on plans by consultants? The official DOT response was:

Other Responses:

- It depends on the project issues.
- We evaluate consultants on this.
- It depends on the situation at hand. If the consultant or the utility owner provided erroneous information we could go after them.
- The department usually carries the burden for errors and omissions, as a change of condition, if they are encountered during the project. A SUE consultant would be responsible for what they located not what they couldn't locate.
However, within the DOT there was the following diversity of opinion to the official response.

5.14 Question II 15 (This question is to be filled out only by the person responsible to collate answers)

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement

- Red: 22.7%
- Green: 45.6%
- Yellow: 13.6%
- Blue: 13.2%
20) Which of the following elements are routinely considered as a valid reason for a design change as a result of a utility conflict? (Mark all answers that apply.) The official DOT response was:

Other Responses:

<table>
<thead>
<tr>
<th>Element</th>
<th>Percentage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of the travel lanes</td>
<td>43.2%</td>
<td></td>
</tr>
<tr>
<td>Rights of Way procurement</td>
<td>64.9%</td>
<td></td>
</tr>
<tr>
<td>Cuts &amp; fills</td>
<td>70.3%</td>
<td></td>
</tr>
<tr>
<td>Structures - such as retaining walls</td>
<td>73.0%</td>
<td></td>
</tr>
<tr>
<td>Drainage</td>
<td>83.8%</td>
<td></td>
</tr>
<tr>
<td>Signage</td>
<td>51.4%</td>
<td></td>
</tr>
<tr>
<td>Lighting</td>
<td>54.1%</td>
<td></td>
</tr>
<tr>
<td>Traffic signalization</td>
<td>48.6%</td>
<td></td>
</tr>
<tr>
<td>Overhead signs</td>
<td>45.9%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5.4%</td>
<td></td>
</tr>
</tbody>
</table>

Depending upon the nature of the conflict, any of them. It depends on the cost to benefit analysis these are "most often" maybe not "routine" cost and time of utility relocation. These are predicated on changes during design, not during construction.
However, within the DOT there was the following diversity of opinion to the official response.

[Diagram showing the distribution of responses:]
- **RED:** Survey takers completely agree on...
- **GREEN:** Survey takers are mostly in agreement...
- **YELLOW:** Survey takers disagree somewhat...
- **BLUE:** Survey takers are in complete disagreement...

- RED: 5
- GREEN: 13
- YELLOW: 2
- BLUE: 1

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement
21) If such a design change is suggested, who does the suggesting? (Mark all answers that apply.) The official DOT response was:

Other Responses:

- Usually the utility owner identifies and requests modification, but Util. Coord or Designer may identify the conflict as well.
- Any member of the design team
- Anyone involved that can present an improved project.
- Field engineer
- Construction personnel
However, within the DOT there was the following diversity of opinion to the official response.

**5.16 Question II 21** This question is to be filled out only by the person responsible to collate answers

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>Survey takers completely agree on the response</td>
<td>8</td>
</tr>
<tr>
<td>GREEN</td>
<td>Survey takers mostly in agreement</td>
<td>14</td>
</tr>
<tr>
<td>YELLOW</td>
<td>Survey takers disagree somewhat</td>
<td>1</td>
</tr>
<tr>
<td>BLUE</td>
<td>Survey takers in complete disagreement</td>
<td>1</td>
</tr>
</tbody>
</table>

RED:  Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE:  Survey takers are in complete disagreement
22) Is there a formal approval process required to make a design change in order to accommodate a utility? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
23) If Yes, is there a threshold for this approval based on cost, time, or other factors? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement
24) Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design? The official DOT response was:

Comment Responses:

<table>
<thead>
<tr>
<th>Utility</th>
<th>Always</th>
<th>Most of the Time</th>
<th>Some of the Time</th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell towers</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Few steam conflicts with MoDOT projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everything should be considered.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All are case by case.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We &quot;always consider, above is frequency&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We often try to design around utilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>each case is considered on its own merit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>all evaluated on a case-by-case basis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>based on a cost analysis of the options</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We would design around were possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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However, within the DOT there was the following diversity of opinion to the official response.

5.19) Question 24 (This question is &nbsp; to be filled out only by the person responsible to collate answer)

- RED: Survey takers completely agree on ...
- GREEN: Survey takers are mostly in agreement
- YELLOW: Survey takers disagree somewhat
- BLUE: Survey takers are in complete disagreement

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement
Here is the detailed response for each question asked in # 24.

24.1) Transmission Gas Pipeline (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

![Pie chart showing responses to the question about accommodating transmission gas pipelines.]

- **Always**: 8
- **Most of the Time**: 21
- **Some of the Time**: 7
- **Only in unusual circumstances**: 0
- **Never**: 0

The pie chart indicates that most respondents would consider a design change in most of the time, with a small percentage always considering it. There are no responses indicating never considering it.
24.2) Distribution natural gas (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

24.2) Distribution natural gas (Would you consider a design change in order to accommodate the followi

![Pie chart showing responses to the question about accommodating distribution natural gas utilities in conflict with highway design.

- Always: 4
- Most of the Time: 11
- Some of the Time: 15
- Only in unusual circumstances: 6
- Never: 0]
24.3) Water lines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)
24.4) Aerial transmission power lines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

24.4) Aerial transmission power lines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

- Always: 7
- Most of the Time: 17
- Some of the Time: 9
- Only in unusual circumstances: 3
- Never: 0
24.5) Aerial distribution power lines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)
24.6) Aerial communication lines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)
24.7) Buried transmission electric facilities (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

24.7) Buried transmission electric facilities (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

- Always: 7
- Most of the Time: 15
- Some of the Time: 12
- Only in unusual circumstances: 1
- Never: 0

42.9%
20.0%
0.0%
2.9%
34.3%
24.8) encased distribution electric lines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)
24.9) direct-buried distribution electric lines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

![Pie chart showing distribution of responses:]

- Always: 2
- Most of the Time: 10
- Some of the Time: 13
- Only in unusual circumstances: 11
- Never: 0
encased communication facilities
Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?

<table>
<thead>
<tr>
<th>Choice</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>3</td>
</tr>
<tr>
<td>Most of the Time</td>
<td>6</td>
</tr>
<tr>
<td>Some of the Time</td>
<td>23</td>
</tr>
<tr>
<td>Only in unusual circumstances</td>
<td>3</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
</tr>
</tbody>
</table>

63.9%
24.11) direct-buried communication facilities (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

![Pie chart showing responses to the question about accommodating direct-buried communication facilities. The chart indicates the percentage of respondents who would consider a design change in each category: Always (2%), Most of the Time (7%), Some of the Time (16%), Only in unusual circumstances (9%), and Never (2%).]
24.12) substations (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)
24.13) buried environmentally-controlled vaults (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

- Always: 10
- Most of the Time: 13
- Some of the Time: 10
- Only in unusual circumstances: 3
- Never: 0
24.14) gravity sanitary systems (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

- Always: 4
- Most of the Time: 11
- Some of the Time: 15
- Only in unusual circumstances: 6
- Never: 0

41.7%: 30.6%: 11.1%: 0.0%: 18.7%
24.15) pressure sanitary systems (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

24.15) pressure sanitary systems (Would you consider a design change in order to accommodate the follow...
24.16) Storm drainage (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

- Always: 2
- Most of the Time: 8
- Some of the Time: 14
- Only in unusual circumstances: 10
- Never: 2
24.17) large commercial services (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)
24.18) Residential services (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Response</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>41.7%</td>
<td>Always</td>
<td>2</td>
</tr>
<tr>
<td>11.1%</td>
<td>Most of the Time</td>
<td>3</td>
</tr>
<tr>
<td>8.3%</td>
<td>Some of the Time</td>
<td>12</td>
</tr>
<tr>
<td>5.6%</td>
<td>Only in unusual circumstances</td>
<td>15</td>
</tr>
<tr>
<td>33.3%</td>
<td>Never</td>
<td>4</td>
</tr>
</tbody>
</table>
24.19) Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?

24.19) Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?

- Always: 2
- Most of the Time: 9
- Some of the Time: 16
- Only in unusual circumstances: 8
- Never: 1

Diagram showing the distribution of responses.
24.20) Petroleum Pipelines (Would you consider a design change in order to accommodate the following utilities (in their own easements) in conflict with the highway design?)

![Pie chart showing the distribution of responses to the question.]

- Always: 6
- Most of the Time: 18
- Some of the Time: 10
- Only in unusual circumstances: 1
- Never: 0

51.4%: 17.1%: 28.6%: 0.0%: 2.9%
25) Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design? The official DOT response was:

Comment Responses:

<table>
<thead>
<tr>
<th>Utility</th>
<th>Always</th>
<th>Most of the Time</th>
<th>Some of the Time</th>
<th>Some of the Time</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum pipelines</td>
<td>2.7%</td>
<td>18.9%</td>
<td>34.7%</td>
<td>37.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Steam</td>
<td>18.1%</td>
<td>18.9%</td>
<td>40.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential services</td>
<td>10.8%</td>
<td>29.7%</td>
<td>45.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large commercial services</td>
<td>5.4%</td>
<td>18.9%</td>
<td>40.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storm drainage</td>
<td>5.4%</td>
<td>18.9%</td>
<td>45.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure sanitary systems</td>
<td>2.7%</td>
<td>15.2%</td>
<td>51.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravity sanitary systems</td>
<td>12.7%</td>
<td></td>
<td></td>
<td>59.5%</td>
<td></td>
</tr>
<tr>
<td>Buried environmentally controlled substations</td>
<td>0.0%</td>
<td>3.5%</td>
<td>29.7%</td>
<td>35.1%</td>
<td></td>
</tr>
<tr>
<td>Direct-buried communication lines</td>
<td>8.1%</td>
<td></td>
<td></td>
<td>32.4%</td>
<td></td>
</tr>
<tr>
<td>Encased communication lines</td>
<td>5.4%</td>
<td>18.9%</td>
<td>40.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct-buried distribution electr...</td>
<td>5.4%</td>
<td>6%</td>
<td>29.7%</td>
<td>43.2%</td>
<td></td>
</tr>
<tr>
<td>Encased distribution electric In...</td>
<td>2.7%</td>
<td>24.3%</td>
<td>40.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buried transmission electric faci...</td>
<td>2.7%</td>
<td>24.3%</td>
<td>40.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerial communication lines</td>
<td>5.4%</td>
<td>37.8%</td>
<td>45.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerial distribution power lines</td>
<td>5.4%</td>
<td>37.8%</td>
<td>45.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerial transmission power lines</td>
<td>2.7%</td>
<td>24.3%</td>
<td>48.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water lines</td>
<td>2.7%</td>
<td>15.2%</td>
<td>51.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution natural gas</td>
<td>2.7%</td>
<td>16.9%</td>
<td>45.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission gas pipeline</td>
<td>0.0%</td>
<td>18.9%</td>
<td>29.7%</td>
<td>3.2%</td>
<td></td>
</tr>
</tbody>
</table>
However, within the DOT there was the following diversity of opinion to the official response.

5.20) Question II 25: (This question is intended to be filled out only by the person responsible to collate answ

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement
Here is the detailed response for each question asked in # 25.

25.1) Transmission gas pipeline (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing responses to the question about accommodating utilities in conflict with the highway design.]

- **Always**: 7
- **Most of the Time**: 16
- **Some of the Time**: 11
- **Only in unusual circumstances**: 2
- **Never**: 0

The chart shows the percentage of respondents who would consider a design change under different conditions.
25.2) Distribution natural gas (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)
25.3) Water lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)
25.4) Aerial transmission power lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing responses to aerial transmission power lines]

- **Always**: 7 responses
- **Most of the Time**: 9 responses
- **Some of the Time**: 18 responses
- **Only in unusual circumstances**: 3 responses
- **Never**: 1 response

Percentage breakdown:
- **Always**: 18.9%
- **Most of the Time**: 24.3%
- **Some of the Time**: 48.6%
- **Only in unusual circumstances**: 8.1%
- **Never**: 2.7%
25.5) Aerial distribution power lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

25.5) Aerial distribution power lines (Would you consider a design change in order to accommodate the follow...
25.6) Aerial communication lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)
25.7) Buried transmission electric facilities (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing the response to the question about accommodating utilities in conflict with highway design. The chart indicates that most respondents would accommodate the utilities to some degree, with the majority indicating they would accommodate some of the time.](chart.png)
25.8) Encased distribution electric lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing the percentage of responses for different scenarios.]

- Always: 13.5%
- Most of the Time: 13.5%
- Some of the Time: 43.2%
- Only in unusual circumstances: 21.6%
- Never: 2.7%

Legend:
- Always
- Most of the Time
- Some of the Time
- Only in unusual circumstances
- Never
25.9) Direct-buried distribution electric lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)
25.10) Encased communication lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing the percentage of respondents for different scenarios regarding the design change.]

- **Always**: 4
- **Most of the Time**: 4
- **Some of the Time**: 19
- **Only in unusual circumstances**: 7
- **Never**: 2
25.11) Direct-buried communication lines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

[Graph showing survey results with categories: Never (81%), Only in unusual circumstances (32.4%), Some of the Time (40.5%), Most of the Time (8.1%), Always (8.1%).]
25.12) substations (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing the responses to the question about accommodating utilities in conflict with highway design. The chart shows the percentage of respondents who would consider a design change in different scenarios: Never (3.0%), Only in unusual circumstances (8.1%), Some of the Time (16.2%), Most of the Time (35.1%), and Always (35.1%).]
25.13) Buried environmentally controlled vaults (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing responses to the question related to accommodating utilities in environmentally controlled vaults.](chart.png)
25.14) Gravity sanitary systems (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

[Diagram showing the percentage of respondents who would consider a design change under different circumstances:}

- **Never**: 2.7%
- **Only in unusual circumstances**: 8.1%
- **Some of the Time**: 59.5%
- **Most of the Time**: 13.5%
- **Always**: 10.8%

Legend:
- Red: Always
- Green: Most of the Time
- Yellow: Some of the Time
- Blue: Only in unusual circumstances
- Gray: Never

Total respondents: 38
25.15) Pressure sanitary systems (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing the percentage of responses for accommodating pressure sanitary systems.]

- Always: 4%
- Most of the Time: 5%
- Some of the Time: 19%
- Only in unusual circumstances: 6%
- Never: 1%

Bar chart indicates that the majority (51.4%) of respondents would accommodate the utilities some of the time.
25.16) Storm drainage (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing responses to storm drainage questions]
25.17) Large commercial services (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing responses to the question]

- **Never**: 5.4%
- **Only in unusual circumstances**: 18.3%
- **Some of the Time**: 51.4%
- **Most of the Time**: 10.8%
- **Always**: 10.8%

Legend:
- Always: 4
- Most of the Time: 4
- Some of the Time: 19
- Only in unusual circumstances: 7
- Never: 2
25.18) Residential services (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)}
25.19) Steam (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

25.19) Steam (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

- Never: 81%
- Only in unusual circumstances: 18.9%
- Some of the Time: 40.5%
- Most of the Time: 18.9%
- Always: 5.4%

Legend:
- Always: 2
- Most of the Time: 7
- Some of the Time: 15
- Only in unusual circumstances: 7
- Never: 3
25.20) Petroleum pipelines (Would you consider a design change in order to accommodate the following utilities (in the right of way by permit) in conflict with the highway design?)

![Bar chart showing responses to the question about design changes for petroleum pipelines.]
26) When do you or the utility owner excavate test holes on existing utilities to determine vertical conflicts? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
Here is the detailed response for each question asked in # 26.

26.1) 0-10% design (When do you or the utility owner excavate test holes on existing utilities to determine vertical conflicts?)

![Bar chart showing the frequency of excavation practices for 0-10% design.]

- **Never**: 29.7%
- **Rarely**: 54.1%
- **Sometimes**: 8.1%
- **Almost always**: 0.0%
- **Most of the time**: 0.0%

Legend:
- Red: Never
- Green: Rarely
- Yellow: Sometimes
- Blue: Most of the time
- Gray: Almost always
26.2) 10-30% design (When do you or the utility owner excavate test holes on existing utilities to determine vertical conflicts?)
26.3) 30-70% design (When do you or the utility owner excavate test holes on existing utilities to determine vertical conflicts?)
26.4) 70-90% design (When do you or the utility owner excavate test holes on existing utilities to determine vertical conflicts?)

- Almost always: 8.1%
- Most of the time: 16.2%
- Sometimes: 45.9%
- Rarely: 24.3%
- Never: 5.4%
26.5) 90-100% design (When do you or the utility owner excavate test holes on existing utilities to determine vertical conflicts?)
26.6) During Construction (When do you or the utility owner excavate test holes on existing utilities to determine vertical conflicts?)

[Bar chart showing the responses to the question. The chart indicates the percentage of respondents who select each option: Never (2%), Rarely (8%), Sometimes (45.9%), Most of the time (4%), and Almost always (4%).]
27) We routinely use the following guidance documents for design as it relates to utilities (Mark all answers that apply.) The official DOT response was:

- FHWA - "Avoiding Utility Relocations"
- CI/ASCE 38-02 - "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data"
- AASHTO - "A Policy on Geometric Design of Highways and Streets"
- FHWA - "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects"
- AASHTO Strategic Plan Strategy 4-4: "Right of Way and Utilities Guidelines and Best Practices"
- State One-Call Statute "Design Ticket"
- AASHTO - "A Policy on the Accommodation of Utilities Within Freeway Right-of-Way"
- FHWA - "Program Guide: Utility Relocation and Accommodation on Federal-Aid Highway Projects"
- State Utility Accommodation Rules

Other (please specify)

Other Responses:
- One Call and State utility accom rules used by most.
- Define routinely.
- WisDOT Guide to Utility Coordination
- Lots of different responses
- Other DOT Design Manuals
However, within the DOT there was the following diversity of opinion to the official response.

5.22) Question #27 (This question is to be filled out only by the person responsible to collate anew)

- RED: Survey takers completely agree on ...
- GREEN: Survey takers are mostly in agreement
- YELLOW: Survey takers disagree somewhat
- BLUE: Survey takers are in complete disagreement

40.3% 27.3% 31.8% 0.0%
28) We outsource the following functions. The official DOT response was:

Comment Responses:

Utilities provide all design and cost estimates. Specs if work performed by state contractor.
Actual utility relocation design is the responsibility of the utility owner.
Relocation design & construction inspection performed by utility owners
Cost estimates and design done by utilities
It depends on whether the project is designed in-house or by consultant
We hire consultants to do the same as KDOT
ADOT typically negotiates all expensive & interesting utility conflicts.
However, within the DOT there was the following diversity of opinion to the official response.

5.23 | Question #28 | This question is to be filled out only by the person responsible to collate answers.

- RED: Survey takers completely agree
- GREEN: Survey takers are mostly in agreement
- YELLOW: Survey takers disagree somewhat
- BLUE: Survey takers are in complete disagreement

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey takers completely agree on</td>
<td>5</td>
<td>22.7%</td>
</tr>
<tr>
<td>Survey takers are mostly in agreement</td>
<td>13</td>
<td>59.1%</td>
</tr>
<tr>
<td>Survey takers disagree somewhat</td>
<td>4</td>
<td>19.2%</td>
</tr>
<tr>
<td>Survey takers are in complete disagreement</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Here is the detailed response for each question asked in # 28.

28.1) Depicting aerial utilities on plans (We outsource the following functions)

![Bar chart showing the response distribution]
- Never: 8
- Rarely: 4
- Sometimes, on select projects: 15
- A majority of the time: 6
- Almost always: 2
28.2) Depicting subsurface utilities on plans (We outsource the following functions)
28.3) Utility Conflict identification (We outsource the following functions)
28.4) Utility conflict resolution (We outsource the following functions)

- Never: 6%
- Rarely: 9%
- Sometimes, on select projects: 16%
- A majority of the time: 3%
- Almost always: 0%
28.5) utility relocation cost estimates (We outsource the following functions)

![Bar chart showing utility relocation cost estimates]

- Never: 29.7%
- Sometimes, on select projects: 29.7%
- Rarely: 24.3%
- A majority of the time: 5.4%
- Almost always: 8.1%

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>11</td>
</tr>
<tr>
<td>Rarely</td>
<td>9</td>
</tr>
<tr>
<td>Sometimes, on select projects</td>
<td>11</td>
</tr>
<tr>
<td>A majority of the time</td>
<td>2</td>
</tr>
<tr>
<td>Almost always</td>
<td>3</td>
</tr>
</tbody>
</table>
28.6) Review of plans & estimates (We outsource the following functions)

- Never: 21.6%
- Rarely: 32.4%
- Sometimes, on select projects: 35.1%
- A majority of the time: 5.4%
- Almost always: 2.7%
28.7) drafting of special provisions (We outsource the following functions)

28.7) drafting of special provisions (We outsource the following functions)

- Never: 7
- Rarely: 14
- Sometimes, on select projects: 14
- A majority of the time: 1
- Almost always: 0
28.8) utility relocation design (We outsource the following functions)

- Never: 9
- Rarely: 5
- Sometimes, on select projects: 13
- A majority of the time: 1
- Almost always: 7

- Never: 24.3%
- Rarely: 13.5%
- Sometimes, on select projects: 35.1%
- A majority of the time: 2.7%
- Almost always: 18.9%
28.9) utility construction inspection (We outsource the following functions)
29) We estimate we (the DOT) spend approximately the following amounts per year. The official DOT response was:

- Getting subsurface utility information depicted on design plans in-house: 71.4%
- Getting subsurface utility information depicted on design plans by consultant designers: 17.3%
- For a "formal" SUE utility mapping program: 10.0%
- Educating our designers on utility issues: 66.7%
- On utility relocations that are state cost responsibility: 6.0%
- On utility coordination functions: 4.8%
- On utility change orders during construction: 39.4%
- On utility claims during or post construction: 12.1%
- On utility coordination functions: 1.2%
- On utility relocations that are state cost responsibility: 1.2%
- On utility change orders during construction: 9.1%
- On utility claims during or post construction: 1.0%
- On utility coordination functions: 1.0%
- On utility relocations that are state cost responsibility: 1.0%
- On utility change orders during construction: 9.1%
- On utility claims during or post construction: 1.0%
However, within the DOT there was the following diversity of opinion to the official response.

5.24 | Question 1129 | This question is &nbsp; to be filled out only by the person responsible to collate answers

RED: Survey takers are in complete agreement
GREEN: Survey takers are mostly in agreement
YELLOW: Survey takers disagree somewhat
BLUE: Survey takers are in complete disagreement

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Here is the detailed response for each question asked in # 29.

29.1) getting subsurface utility information depicted on design plans in-house (We estimate we (the DOT) spend approximately the following amounts per year)

![Pie chart showing spending distribution]

- 56.3% for less than $250,000
- 25.0% for $250,000 - $500,000
- 12.5% for $500,000 - $1M
- 3.1% for $1M - $3M
- 3.1% for $3M - $7M
- 0.0% for > $7M
29.2) getting subsurface utility information depicted on design plans by consultant designers (We estimate we (the DOT) spend approximately the following amounts per year)
29.3) for a "formal" SUE utility mapping program (We estimate we (the DOT) spend approximately the following amounts per year)
29.4) Educating our designers on utility issues (We estimate we (the DOT) spend approximately the following amounts per year)
29.5) on utility relocations that are state cost responsibility (We estimate we (the DOT) spend approximately the following amounts per year)
29.6) on utility coordination functions (We estimate we (the DOT) spend approximately the following amounts per year)
29.7) on utility change orders during construction (We estimate we (the DOT) spend approximately the following amounts per year)
29.8) on utility claims during or post construction (We estimate we (the DOT) spend approximately the following amounts per year)
30) Do you have any case studies that evaluate the costs of designing a project around existing utilities versus relocating them? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
31) Do you have a database that includes project information on utility relocation costs? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
32) If Yes, does this database include both costs to the utility and costs to the state? The official DOT response was:

However, within the DOT there was the following diversity of opinion to the official response.
33) Do you have additional information not covered in this questionnaire that is pertinent to the issue of whether it is better to design around utilities or have them relocate?

Other Responses:

Design around to accelerate construction: Design Build
Utility Impact Analysis (UIA)
Each case is considered on its own merit
34) Do you have additional information that could benefit other DOTs on your DOT's process to decide whether to design around a utility or relocate it?

Other Responses:

Design Utility corridors if design cannot accommodate the existing utility in conflict
Implement/Mandate the UIA into the design phase