Cell Phone Ring Suppression and HUD Caller ID: Effectiveness in Reducing Momentary Driver Distraction Under Varying Workload Levels

UMTRI Technical Report 2001-29
University of Michigan
Christopher Nowakowski, Dana Friedman & Paul Green
Ann Arbor, Michigan, USA

1 Issues

1. Does the location of a caller ID display and phone buttons affect either the time to answer the phone or driving performance?
2. Does the presence or absence of an auditory ring (where the HUD caller ID indicated a call) affect either the time to answer the phone or driving performance?
3. Does increased driving workload affect either the time to answer the phone or driving performance?
4. What were the initial driver reactions to a HUD-based call timer?

2 Test Plan

Test Participants

<table>
<thead>
<tr>
<th>N=24</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older (60-75)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Younger (18-30)</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

3 Results and Conclusions

Issue 1: Effects of caller ID and button location
### Issue 2: Effect of auditory ring

- **No. of Drivers** | **Ring/No Ring Difference**
- 10/24 | Response time unaffected
- 9/24 | Response time slowed
- 5/24 | No consistent RT trends
- 24/24 | Driving performance unaffected by the ring

### Issue 3: Effect of driving workload

- **Response Time (s)**
- **Std Dev Lane Position (ft)**
- **Line-Crossing Rate (%)**

### Issue 4: Driver reactions to call timer

- a. Seventy percent of drivers did not want to see the call timer.
- b. All drivers wanting the call timer also preferred the center HUD location.
- c. Many commented that they didn’t notice the call timer in any of the locations.

## 4 Design Recommendations

<table>
<thead>
<tr>
<th>Design Parameter</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caller ID Location</td>
<td>Use a central HUD location (e.g., within approximately 5 degrees down and 5 degrees right or left from center).</td>
</tr>
<tr>
<td>Button Locations</td>
<td>Use steering wheel buttons for “Talk” and “End.”</td>
</tr>
<tr>
<td>Auditory Ring</td>
<td>Response time data suggests that the use of short auditory alerts (1 second or less) might be less distracting, but more research on other rings (including musical rings) is needed.</td>
</tr>
<tr>
<td>Call Timer</td>
<td>Preference data indicated that drivers did not want to see a call timer that was continuously updated on the HUD.</td>
</tr>
</tbody>
</table>