REACH

eCVSP Metrics Monitoring Project
The Problem

Today, law enforcement officials enter data into the FMCSA’s electronic CVSP (eCVSP) system regarding their planned safety activities and anticipated incidents (crashes); then, they manually compare actual results to the plan. This process is error-prone, time-consuming, and labor intensive, so that the comparison can only be done once per quarter.
The Problem -> The Target

- Manual comparison -> Automate
- Error-prone -> Accurate
- Time-consuming -> Fast
- Labor-intensive -> Easy
- Quarterly comparisons -> Frequent
The Approach

1) Give the user actionable information.
2) Don’t force the user to come to you.
3) Make an assistant, not a replacement.
Our Solution
State of Your Goal

**In Danger**
- RED. Stop. **Change something.**
- What went wrong?
- What can be done next time?

**Warning**
- YELLOW. Speed up or slow down. **Make a decision.**
- What is going wrong?
- What can be done now?

**On Target**
- GREEN. Go. **Keep it up.**
- What is going right?
- What can be learned?
# Active vs. Passive Goal Systems

<table>
<thead>
<tr>
<th>Active</th>
<th>Passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell you how you’re doing</td>
<td>Show you what you’re doing (activity only)</td>
</tr>
<tr>
<td>• Meeting your goal</td>
<td></td>
</tr>
<tr>
<td>• In danger of missing your goal</td>
<td></td>
</tr>
<tr>
<td>• Missing/missed your goal</td>
<td></td>
</tr>
<tr>
<td>Aware of your goals</td>
<td>Unaware of your goals</td>
</tr>
<tr>
<td>Warns you before missing, hopefully giving you time to react</td>
<td>Require you to check and stay on top of the goal to prevent missing</td>
</tr>
<tr>
<td>Example: REACH</td>
<td>Example: ADVANCE</td>
</tr>
</tbody>
</table>


Passive Goal System: ADVANCE
Passive Goal System: ADVANCE

• Custom reports. Can be set up to email on a schedule.
• Reports usually match previous paper reports that were manually generated.
• Aggregate statistics for crashes, citations, etc.
• Updated daily (typically).
REACH: The Process

- **Import Data**
- **Process Data**
- **Compare to Goals**
- **Send Notifications**
- **Process Output (Goal Display)**
REACH: The Components

Goals System

Data Processing
Notifications
UI/Maps/Charts

Data Import
External System Interaction
REACH Main Screens

- Dashboard
- Goal Entry
- Goal List
- Goal Details
- In Progress: Activity Corridors
- In Progress: Settings and Notifications
Dashboard
Dashboard

• Summary of all of your goals.
• Browse your list of current goals.
• See past goals.
Goal Entry

Goal Name: CMV CU Quarterly

Data Source: Crashes (AL)

Group By: CMV Caused

Goal Value: Below

Interval: Quarterly

Continuous: Yes

Add Form

CMV Caused

Submit Clear
Goal Entry

• Name
• Data Source
• Group By (Will display this variable in the goal)
• Goal Value (Above/Below)
• Interval (can be recurring)
  – Daily/Weekly/Monthly/Quarterly/Yearly
• Filters (optional)
  – Any categorical variable, any combination of values
Goal Entry Example

- Name: “CMV CU Pre-Workzone Quarterly”
- Data: “Crash”
- Group By: “Workzone Involved”
- Target: “Below: 500”
- Interval: “Quarterly, Recurring: Yes”
- “CMV CU: Yes, Workzone Involved: Yes”
<table>
<thead>
<tr>
<th>Data Set</th>
<th>Goal Name</th>
<th>Start Date</th>
<th>End Date</th>
<th>Interval</th>
<th>Target</th>
<th>Variable Name</th>
<th>Goal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspections (GA)</td>
<td>P4f: Inspections (2017)</td>
<td>Oct 1, 2016</td>
<td>Oct 1, 2017</td>
<td>MAX</td>
<td>Region</td>
<td>6000</td>
<td></td>
</tr>
</tbody>
</table>

71 total
Goal Details

CMV CU Quarterly

Values at 2017 - Q2
- undefined: 1129
- Yes - CU is a CMV: 1129
- CU is Not a Vehicle: 1219
- CU is Unknown: 2572

Analytics

This goal is to have at most 500 Crashes (AL) per quarter
Goal Details

- Detailed graph for period.
- Filterable variable values.
- Export CSV and image (PNG).
- “Goal line” that shows goal value.
Under Construction
Notifications

• Goal updates via email
• Customizable by user and by goal
• Notify when you:
  – Have Met (or surpassed) a goal
  – Are at risk of missing a goal
  – Have missed a goal
• How frequent?
• What about recurring goals?
Under Construction

Goal System

• Lots of work on how to determine when goals are in each state.

• Activity isn’t regular.
  – There are dips and spikes, often unpredictable.

• Several ideas in progress:
  – Simple rate (assuming the same rate)
  – Adjusted rate (comparing with similar data)
  – ML/AI (building a learning model of your dataset)
Under Construction

Activity (Crash) Corridors

Activity (Crash) Corridors

REACH

http://reach.caps.ua.edu

CMV Caused

Workzone Related

CMV Involved

CMV Caused

Workzone Related

CMV Involved

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Under Construction

Activity (Crash) Corridors

• Uses CARE/ADVANCE mapping systems.
• “Locked pan/zoom” functionality (Panning/zooming on one map can move the others, too)
• Working to extend to non-crash datasets (i.e. Activity Corridors).
Thanks to Our Partners!

- Federal Motor Carrier Safety Administration
- University of Alabama
- Alabama Law Enforcement Agency (Motor Carrier Safety Unit)
- Arkansas Highway Police
- Mississippi Highway Safety Patrol (Motor Carrier Safety Division)
- Georgia Department of Public Safety (Motor Carrier Compliance Division)
Thank You!

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