Step 1. Problem Outline

<table>
<thead>
<tr>
<th>What</th>
<th>Problem(s)</th>
<th>When</th>
<th>Recall, acceleration problem</th>
<th>Date</th>
<th>Recall announced September 29, 2009</th>
<th>Recall in vehicles sold since 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where</td>
<td>Geographical location</td>
<td>Equipment</td>
<td>USA and Canada</td>
<td>2007-2010 Toyota Camry</td>
<td>2006-2010 Toyota Avalon</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Differences</td>
<td></td>
<td></td>
<td>2004-2009 Toyota Prius</td>
<td>2005-2010 Toyota Tacoma</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2007-2010 Toyota Tundra</td>
<td>2007-2010 Lexus ES 350</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006-2010 Lexus IS 250</td>
<td>2006-2010 Lexus IS 250</td>
<td></td>
</tr>
</tbody>
</table>

Impact to the Goals

- **Safety**
  - At least 5 fatalities
  - At least 17 vehicle crashes

- **Cost Service**
  - At least 100 NHTSA complaints

- **Production Schedule**
  - Recall of 4.26 million vehicles

- **Property**
  - Replace accelerator pedals and floor mats (**industry expert estimation**)
  - $250 M

- **Production Goal**
  - Replacement of accelerator pedals, floor mats

- **Customer Service Goal**
  - At least 100 NHTSA complaints

- **Loss of control of vehicle**

Step 2. Cause Map

5-Why Level

- Safety Goal Impacted
  - At least 5 fatalities
- Loss of control of vehicle
- Sudden burst of acceleration
- Accelerator pedal entrapment
- Floor mat interference

Why?

Effect  Cause

Step 2. Cause Map

Detail Level

- Production Goal Impacted
  - Recall of 4.26 million vehicles
- Replacement of accelerator pedals, floor mats

- Customer Service Goal Impacted
  - At least 100 NHTSA complaints

Why?

Evidence: NHTSA report; more fatalities suggested by other sources

AND

Evidence: NHTSA report; more crashes suggested by other sources

Safety Goal Impacted

- At least 5 fatalities

- Safety Goal Impacted

- Evidence: NHTSA report; more fatalities suggested by other sources

- Safety Goal Impacted

- At least 17 vehicle crashes

- Loss of control of vehicle

Step 3. Action Items

<table>
<thead>
<tr>
<th>No.</th>
<th>Cause</th>
<th>Action Item</th>
<th>Owner</th>
<th>Type</th>
<th>When?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Accelerator pedal entrapment</td>
<td>Reconfigure accelerator pedal</td>
<td>Toyota</td>
<td>Permanent</td>
<td>Ongoing</td>
</tr>
<tr>
<td>2</td>
<td>Floor mat interference</td>
<td>Replace floor mats</td>
<td>Toyota</td>
<td>Permanent</td>
<td>Ongoing</td>
</tr>
<tr>
<td>3</td>
<td>Remove floor mats</td>
<td>Owners</td>
<td>Interim</td>
<td>Immediately</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Shift car into neutral</td>
<td>Driver</td>
<td>Interim</td>
<td>If unable to control acceleration</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brake override system</td>
<td>Toyota</td>
<td>Permanent</td>
<td>Ongoing</td>
<td></td>
</tr>
</tbody>
</table>

*NHTSA = National Highway Transportation Safety Administration*

There have been at least 5 fatalities addressed by the National Highway Transportation Safety Administration (NHTSA), though some media outlets have reported more. Additionally, the NHTSA has reported 17 accidents (again, some claim more) and has received at least 100 complaints. The fatalities and accidents are impacts to the safety goal. Complaints are impacts to the customer service goal. The recall of more than 4 million cars is an impact to the production/schedule goal, and the replacement of the accelerator pedals and floor mats as a result of the recall is estimated to cost $250 million, which is an impact to the property goal.

The fatalities are caused by vehicle crashes resulting from a loss of control of the vehicle. The loss of control is caused by a sudden surge of acceleration, inability to brake, and sometimes an inability to shut down the engine of the car. Toyota says the sudden bursts of acceleration are caused by entrapment of the accelerator pedal due to interference from floor mats. Toyota refutes the possibility that there may be a malfunction in the electronic control system, saying it’s been ruled out by Toyota research.

The vehicles are unable to brake because the brake is non-functional when the accelerator pedal is engaged, as it is in these cases. Additionally, owners whose models are equipped with keyless ignition cannot quickly turn off their ignition. These models require the ignition button to be pressed for 3 seconds to prevent inadvertent engine stops, and the instructions are not posted on the dashboard, so owners who weren’t meticulous about reading (or remembering) instructions from the owners’ manual may not know how to turn off the car while moving at very quick speeds.

The permanent solutions (to be implemented by Toyota) are to reconfigure the accelerator pedal, replace the floor mats, and install a brake override system which will allow the brakes to function even with the accelerator pedal engaged. In the meantime, Toyota has asked owners to remove floor mats, and has put out guidance that drivers who are in an uncontrolled acceleration situation should shift the engine into neutral, which will disengage the engine and allow the brake to stop the car.