Shift Start Location Adjustment

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The Idea

How can we account quantitatively for the fact that players don’t start their shifts in the same places?
Punchline: It doesn’t really matter.
Existing Ideas

- Deleting a bunch of data.
  - Basically kicking puppies.
- Doing arithmetic with faceoff numbers.
  - Not enough faceoffs.
  - Too many faceoffs.
## Shift start locations

<table>
<thead>
<tr>
<th>Shift Start Location</th>
<th>Overall</th>
<th>Forwards</th>
<th>Defenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>OZ</td>
<td>12%</td>
<td>13%</td>
<td>11%</td>
</tr>
<tr>
<td>NZ</td>
<td>18%</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>DZ</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>On-the-fly</td>
<td>59%</td>
<td>58%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Not enough faceoffs: they only cover 40% of the shifts and around 50% of the 5v5 hockey.
Shift Lengths

Too many faceoffs: not every faceoff starts a shift.
Shots around On-the-fly Changes

Shot rates for on-the-fly shifts by previous/next event zone

- DD on-the-fly
- ND on-the-fly
- OD on-the-fly
- DN on-the-fly
- NN on-the-fly
- ON on-the-fly
- DO on-the-fly
- NO on-the-fly
- OO on-the-fly
Shots for and against by shift start
## Adjustment Coefficients

<table>
<thead>
<tr>
<th>Shift Start Location</th>
<th>Shot For</th>
<th>Shot Against</th>
</tr>
</thead>
<tbody>
<tr>
<td>OZ</td>
<td>0.80</td>
<td>1.23</td>
</tr>
<tr>
<td>NZ</td>
<td>1.28</td>
<td>1.18</td>
</tr>
<tr>
<td>DZ</td>
<td>1.33</td>
<td>0.78</td>
</tr>
<tr>
<td><strong>On-the-fly</strong></td>
<td><strong>0.95</strong></td>
<td><strong>0.98</strong></td>
</tr>
</tbody>
</table>

Coefficient for a 5v5 event is the average of the 10 skater values. Rare is expensive, common is cheap.
Most Extreme Adjustments

Raw vs ZS-adjusted 5v5 shots, extreme 2014-2015 skaters
Shift start locations for extreme players

Joensuu: 193 minutes at 5v5 in 20 games for Edmonton.
Shinnimin: 128 minutes at 5v5 in 12 games for Arizona.

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<th>Joensuu</th>
<th>Shinniman</th>
</tr>
</thead>
<tbody>
<tr>
<td>OZ</td>
<td>12%</td>
<td>6%</td>
<td>17%</td>
</tr>
<tr>
<td>NZ</td>
<td>18%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>DZ</td>
<td>11%</td>
<td>33%</td>
<td>6%</td>
</tr>
<tr>
<td>On-the-fly</td>
<td>59%</td>
<td>47%</td>
<td>61%</td>
</tr>
</tbody>
</table>
Adjustments for oft-cited players
Adjustments for season

5% of players with 100 minutes move more than 1% in shot share.
Future Work

- Time-varying Adjustments
- Shadows: shift-end location patterns
- Combined adjustments
Thanks!