Reducing Winter Maintenance Equipment Fuel Consumption Using Advanced Vehicle Data Analytics: Appendices

Will Northrop, Principal Investigator
Mechanical Engineering
University of Minnesota

JANUARY 2023

Research Report
Final Report 2023-03A
This project analyzes the impact that idling and snowfall have on the fuel consumed by MnDOT's snowplow fleet, with the underlying objective to determine and advise MnDOT on ways to reduce fuel usage of the fleet using vehicle telematics data. This is a significant problem to solve as fuel use reduction contributes to MnDOT's sustainability goals of achieving a 30% reduction in fossil fuel use and greenhouse gas (GHG) emissions from 2005 levels by 2025. Furthermore, rising fuel costs are a future cause for concern due to an increase in business operational costs that increases the burden on taxpayers to keep roads safe in winter. This problem is challenging because existing on-board diagnostics (OBD) data do not contain mass information for the trucks' fuel use, which can fluctuate significantly when they are applying deicing substances to the road. Taking a mean value for the vehicle mass, we observe a clear positive correlation between snowfall and average fuel use. For days with snowfall totaling 4 inches or more, fuel use rises more than 25% on average compared to days without snowfall. In addition, the results from the idling analysis indicate that the idling time associated with the fleet is about 23% of total recorded hours and constitutes about 4.3% of the total fuel used. Daily idling activity reports containing information about idling events and fuel economy are generated for the sampled vehicles and shared with MnDOT.
APPENDIX A - DEVICES/VEHICLES CONSIDERED FOR IDLING ANALYSIS

Devices and their associated vehicle are listed in this appendix if data from the device was used in any analysis of idling in this report. There are 459 devices/vehicles used in analyses. Vehicles are assigned to districts by spatially joining their data to districts and selecting the district that is assigned the plurality of the records.

<table>
<thead>
<tr>
<th>District</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Metro</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018–2019</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>2019–2020</td>
<td>8</td>
<td>7</td>
<td>9</td>
<td>3</td>
<td>9</td>
<td>8</td>
<td>9</td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>2020–2021</td>
<td>55</td>
<td>50</td>
<td>52</td>
<td>32</td>
<td>56</td>
<td>37</td>
<td>41</td>
<td></td>
<td>440</td>
</tr>
<tr>
<td>2021-2022</td>
<td>62</td>
<td>43</td>
<td>59</td>
<td>33</td>
<td>49</td>
<td>41</td>
<td>44</td>
<td></td>
<td>459</td>
</tr>
</tbody>
</table>

Table A.1 Vehicle counts by district after exclusions.

**Winter one vehicles (MnDOT vehicle number, AmeriTrak serial number):**

- 207550 (13051010)
- 208553 (13051023)
- 209513 (15022403)
- 210511 (11062202)
- 210512 (12021111)
- 211502 (10111335)
- 211500 (12122317)
- 211502 (10111335)
- 211505 (12122311)
- 211506 (12122321)
- 211508 (11111002)
- 211556 (12112822)
- 211563 (13041117)
- 211565 (12122320)
- 212516 (13041123)
- 212523 (13072020)
- 212529 (11082724)
- 212537 (15031308)
- 215519 (15031301)
- 215550 (15022409)
- 215559 (15031309)
- 215573 (15022818)
- 215574 (15022819)
- 215579 (15022814)
- 215589 (15031308)
- 218564 (17123013)
- 218566 (17123026)

**Winter two vehicles:**

- 205506 (12041106)
- 205585 (11111012)
- 206510 (11111019)
- 206558 (13082426)
- 206566 (10052007)
- 207502 (13081222)
- 207508 (11082705)
- 207511 (12021102)
- 207515 (12021110)
- 207550 (13051010)
- 207552 (13082409)
- 207562 (10111307)
- 207565 (11111004)
- 207580 (12041103)
- 208553 (13051023)
- 209505 (10111336)
- 209513 (15022403)
- 210511 (11062202)
- 211500 (12122317)
- 211502 (10111335)
- 211505 (12122311)
- 211506 (12122321)
- 211508 (11111002)
- 211556 (12112822)
- 211563 (13041117)
- 211565 (12122320)
- 212516 (13041123)
- 212523 (13072020)
- 212529 (11082724)
- 212537 (15031308)
- 212557 (13041109)
- 212560 (11082719)
- 212568 (11111017)
- 213562 (17041101)
- 214514 (12122324)
- 215504 (15022408)
- 215512 (12041009)
- 215519 (15031301)
- 215550 (15022409)
- 215559 (15031309)
- 215569 (15022808)
- 215573 (15022818)
- 215574 (15022819)
- 215579 (15022814)
- 215589 (15031308)
- 218564 (17123013)
- 218566 (17123026)
- 218577 (18013103)
- 218580 (17123020)
<table>
<thead>
<tr>
<th>Winter three vehicles:</th>
</tr>
</thead>
<tbody>
<tr>
<td>204525 (12112817) 205500 (14123010) 205502 (13081208) 205505 (11082714)</td>
</tr>
<tr>
<td>205506 (12041106) 205509 (12112815) 205510 (12112805) 205514 (10111339)</td>
</tr>
<tr>
<td>205550 (13051016) 205552 (13081204) 205554 (13082443) 205556 (13051002)</td>
</tr>
<tr>
<td>205557 (13051028) 205559 (12112824) 205561 (12021108) 205562 (12041012)</td>
</tr>
<tr>
<td>205563 (11122620) 205564 (16041327) 205565 (10052006) 205567 (10111352)</td>
</tr>
<tr>
<td>205582 (12112820) 205583 (12033107) 205585 (11111012) 206501 (13072007)</td>
</tr>
<tr>
<td>206502 (13072001) 206503 (13081219) 206505 (13081223) 206506 (13081217)</td>
</tr>
<tr>
<td>206507 (11122615) 206509 (12041101) 206510 (11111019) 206511 (12033102)</td>
</tr>
<tr>
<td>206515 (13082435) 206516 (13082436) 206518 (12112821) 206521 (10111313)</td>
</tr>
<tr>
<td>206522 (12112826) 206523 (10111317) 206550 (13082406) 206551 (13082407)</td>
</tr>
<tr>
<td>206552 (13082430) 206553 (13072009) 206554 (13082408) 206555 (13082412)</td>
</tr>
<tr>
<td>206556 (13082442) 206557 (13051011) 206558 (13082426) 206559 (14050424)</td>
</tr>
<tr>
<td>206561 (12061111) 206562 (11122606) 206563 (11122604) 206564 (11082717)</td>
</tr>
<tr>
<td>206565 (11111016) 206566 (10052007) 206567 (10111332) 206568 (10111337)</td>
</tr>
<tr>
<td>206575 (11122612) 206577 (11122610) 206579 (10111301) 206582 (12112819)</td>
</tr>
<tr>
<td>207501 (13051012) 207502 (13081222) 207503 (13072008) 207505 (13072011)</td>
</tr>
<tr>
<td>207506 (13072012) 207507 (11122603) 207508 (11082705) 207510 (11122602)</td>
</tr>
<tr>
<td>207511 (12021102) 207515 (12021110) 207521 (14050401) 207524 (12021112)</td>
</tr>
<tr>
<td>207550 (13051010) 207552 (13082409) 207553 (13081212) 207554 (13082405)</td>
</tr>
<tr>
<td>207555 (13081221) 207556 (13082410) 207557 (13082423) 207558 (13081205)</td>
</tr>
<tr>
<td>207559 (13082429) 207560 (13081211) 207561 (13082411) 207563 (11111013)</td>
</tr>
<tr>
<td>207564 (16111702) 207565 (11111004) 207566 (12112801) 207568 (10111347)</td>
</tr>
<tr>
<td>207569 (10111367) 207570 (10052004) 207571 (10111340) 207580 (12041103)</td>
</tr>
<tr>
<td>207584 (13082416) 207585 (15022820) 207588 (12061104) 208500 (13072005)</td>
</tr>
<tr>
<td>208501 (13072006) 208505 (11111010) 208506 (13041105) 208507 (13041115)</td>
</tr>
<tr>
<td>208509 (10111305) 208550 (13051017) 208551 (12122316) 208552 (13082428)</td>
</tr>
<tr>
<td>208553 (13051023) 208555 (13082445) 208556 (14050403) 208558 (10111357)</td>
</tr>
<tr>
<td>208559 (13122119) 208564 (10111326) 208565 (10111323) 208566 (10052005)</td>
</tr>
<tr>
<td>208571 (13082403) 208574 (10111302) 209500 (13081210) 209501 (13072010)</td>
</tr>
<tr>
<td>209503 (11122614) 209504 (12021109) 209505 (10111336) 209509 (13082421)</td>
</tr>
<tr>
<td>209510 (13082402) 209511 (13041106) 209513 (15022403) 209514 (12033103)</td>
</tr>
<tr>
<td>209550 (13081216) 209552 (12041006) 209553 (11080607) 209554 (10111327)</td>
</tr>
<tr>
<td>209556 (11062201) 209563 (13122114) 209567 (12061114) 210502 (11080612)</td>
</tr>
<tr>
<td>210511 (11062202) 210512 (12021111) 210513 (11080614) 210515 (11080605)</td>
</tr>
<tr>
<td>210516 (11080611) 210550 (12041010) 210551 (11082721) 210552 (11111015)</td>
</tr>
<tr>
<td>210553 (11082726) 210554 (13082431) 210555 (11111006) 210557 (11080601)</td>
</tr>
<tr>
<td>210559 (11080606) 210561 (13041104) 210562 (11080617) 210563 (11080610)</td>
</tr>
<tr>
<td>210564 (11080609) 210565 (11080616) 210567 (13122109) 210569 (11080608)</td>
</tr>
<tr>
<td>210570 (11080619) 211500 (12122317) 211501 (13082433) 211502 (10111335)</td>
</tr>
<tr>
<td>211504 (13082425) 211505 (12122311) 211506 (12122321) 211508 (11111002)</td>
</tr>
<tr>
<td>211509 (12112825) 211512 (13041103) 211551 (12122305) 211553 (11111005)</td>
</tr>
</tbody>
</table>
Winter four vehicles:

208566 (10052005)  205565 (10052006)  206566 (10052007)  206579 (10111301)
208574 (10111302)  206521 (10111313)  206523 (10111317)  208565 (10111323)
208564 (10111326)  206567 (10111332)  213512 (10111334)  211502 (10111335)
206568 (10111337)  205514 (10111339)  207569 (10111367)  210511 (11062202)
210557 (11080601)  210515 (11080605)  210559 (11080606)  209553 (11080607)
210569 (11080608)  210564 (11080609)  210563 (11080610)  210513 (11080614)
210565 (11080616)  210562 (11080617)  212554 (11080620)  213563 (11080623)
214562 (110802701)  212512 (110802702)  207508 (11082705)  212567 (11082709)
205505 (11082714)  212527 (11082716)  206564 (11082717)  212560 (11082719)
210551 (11082721)  210553 (11082726)  213508 (11082728)  213559 (11111001)
211508 (11111002)  207565 (11111004)  211553 (11111005)  210555 (11111006)
208505 (11111010)  212555 (11111011)  205585 (11111012)  207563 (11111013)
<table>
<thead>
<tr>
<th>Value</th>
<th>Value</th>
<th>Value</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>206510</td>
<td>206562</td>
<td>205504</td>
<td>207524</td>
</tr>
<tr>
<td>(11111019)</td>
<td>(11122606)</td>
<td>(12021109)</td>
<td>(12021112)</td>
</tr>
<tr>
<td>209503</td>
<td>205563</td>
<td>207515</td>
<td>209514</td>
</tr>
<tr>
<td>(11122614)</td>
<td>(11122620)</td>
<td>(12021110)</td>
<td>(12033102)</td>
</tr>
<tr>
<td>205561</td>
<td>207512</td>
<td>210512</td>
<td>205583</td>
</tr>
<tr>
<td>(12021108)</td>
<td>(12021111)</td>
<td>(12021111)</td>
<td>(12033103)</td>
</tr>
<tr>
<td>207524</td>
<td>209514</td>
<td>205583</td>
<td>210503</td>
</tr>
<tr>
<td>(12021112)</td>
<td>(12033102)</td>
<td>(12033103)</td>
<td>(12041100)</td>
</tr>
<tr>
<td>209552</td>
<td>205562</td>
<td>206509</td>
<td>213555</td>
</tr>
<tr>
<td>(12041100)</td>
<td>(12041102)</td>
<td>(12041101)</td>
<td>(13041103)</td>
</tr>
<tr>
<td>207580</td>
<td>212510</td>
<td>207588</td>
<td>206561</td>
</tr>
<tr>
<td>(12041103)</td>
<td>(12041109)</td>
<td>(12061110)</td>
<td>(12061111)</td>
</tr>
<tr>
<td>206561</td>
<td>205510</td>
<td>212559</td>
<td>212573</td>
</tr>
<tr>
<td>(12061111)</td>
<td>(12112803)</td>
<td>(12112810)</td>
<td>(12112802)</td>
</tr>
<tr>
<td>211557</td>
<td>211556</td>
<td>211550</td>
<td>211564</td>
</tr>
<tr>
<td>(12112812)</td>
<td>(12112821)</td>
<td>(12112822)</td>
<td>(12122318)</td>
</tr>
<tr>
<td>213515</td>
<td>212524</td>
<td>211506</td>
<td>214514</td>
</tr>
<tr>
<td>(12122310)</td>
<td>(12122304)</td>
<td>(12122321)</td>
<td>(12122324)</td>
</tr>
<tr>
<td>211564</td>
<td>212513</td>
<td>212518</td>
<td>211512</td>
</tr>
<tr>
<td>(12122318)</td>
<td>(12122330)</td>
<td>(13041102)</td>
<td>(13041103)</td>
</tr>
<tr>
<td>212500</td>
<td>208506</td>
<td>209511</td>
<td>212500</td>
</tr>
<tr>
<td>(13041107)</td>
<td>(13041105)</td>
<td>(13041106)</td>
<td>(13041107)</td>
</tr>
<tr>
<td>212503</td>
<td>208507</td>
<td>212522</td>
<td>212503</td>
</tr>
<tr>
<td>(13041113)</td>
<td>(13041115)</td>
<td>(13041112)</td>
<td>(13041113)</td>
</tr>
<tr>
<td>211563</td>
<td>212528</td>
<td>212556</td>
<td>212516</td>
</tr>
<tr>
<td>(13041117)</td>
<td>(13041121)</td>
<td>(13041122)</td>
<td>(13041123)</td>
</tr>
<tr>
<td>212516</td>
<td>212525</td>
<td>205556</td>
<td>212505</td>
</tr>
<tr>
<td>(13041123)</td>
<td>(13041130)</td>
<td>(13051002)</td>
<td>(13051004)</td>
</tr>
<tr>
<td>212505</td>
<td>212570</td>
<td>205557</td>
<td>207550</td>
</tr>
<tr>
<td>(13051004)</td>
<td>(13051006)</td>
<td>(13051028)</td>
<td>(13051010)</td>
</tr>
<tr>
<td>207550</td>
<td>207501</td>
<td>206502</td>
<td>208500</td>
</tr>
<tr>
<td>(13051010)</td>
<td>(13051012)</td>
<td>(13072001)</td>
<td>(13072005)</td>
</tr>
<tr>
<td>205550</td>
<td>208553</td>
<td>206553</td>
<td>209501</td>
</tr>
<tr>
<td>(13051016)</td>
<td>(13051019)</td>
<td>(13072009)</td>
<td>(13072010)</td>
</tr>
<tr>
<td>209501</td>
<td>206553</td>
<td>212558</td>
<td>212502</td>
</tr>
<tr>
<td>(13072005)</td>
<td>(13072009)</td>
<td>(13072016)</td>
<td>(13072017)</td>
</tr>
<tr>
<td>205502</td>
<td>207550</td>
<td>212558</td>
<td>212574</td>
</tr>
<tr>
<td>(13081208)</td>
<td>(13081204)</td>
<td>(13081205)</td>
<td>(13081214)</td>
</tr>
<tr>
<td>212574</td>
<td>209500</td>
<td>207550</td>
<td>212575</td>
</tr>
<tr>
<td>(13081214)</td>
<td>(13081210)</td>
<td>(13081211)</td>
<td>(13081241)</td>
</tr>
<tr>
<td>207555</td>
<td>209550</td>
<td>211562</td>
<td>207557</td>
</tr>
<tr>
<td>(13081211)</td>
<td>(13081216)</td>
<td>(13082419)</td>
<td>(13082423)</td>
</tr>
<tr>
<td>207557</td>
<td>206556</td>
<td>211504</td>
<td>208552</td>
</tr>
<tr>
<td>(13082423)</td>
<td>(13082424)</td>
<td>(13082425)</td>
<td>(13082428)</td>
</tr>
<tr>
<td>208552</td>
<td>207559</td>
<td>206552</td>
<td>212550</td>
</tr>
<tr>
<td>(13082428)</td>
<td>(13082429)</td>
<td>(13082430)</td>
<td>(13082432)</td>
</tr>
<tr>
<td>212550</td>
<td>214561</td>
<td>206515</td>
<td>206516</td>
</tr>
<tr>
<td>(13082432)</td>
<td>(13082434)</td>
<td>(13082435)</td>
<td>(13082436)</td>
</tr>
<tr>
<td>206516</td>
<td>213555</td>
<td>208555</td>
<td>211555</td>
</tr>
<tr>
<td>(13082436)</td>
<td>(13082438)</td>
<td>(13082445)</td>
<td>(13082446)</td>
</tr>
<tr>
<td>211555</td>
<td>213555</td>
<td>208555</td>
<td>213550</td>
</tr>
<tr>
<td>(13082446)</td>
<td>(13122101)</td>
<td>(13082445)</td>
<td>(13122104)</td>
</tr>
<tr>
<td>213550</td>
<td>213556</td>
<td>208555</td>
<td>210567</td>
</tr>
<tr>
<td>(13122104)</td>
<td>(13122106)</td>
<td>(13082445)</td>
<td>(13122109)</td>
</tr>
<tr>
<td>210567</td>
<td>213519</td>
<td>209563</td>
<td>213561</td>
</tr>
<tr>
<td>(13122109)</td>
<td>(13122113)</td>
<td>(13122114)</td>
<td>(13122110)</td>
</tr>
<tr>
<td>Code</td>
<td>Code</td>
<td>Code</td>
<td>Code</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>218584 (18013101)</td>
<td>218515 (18013102)</td>
<td>218577 (18013103)</td>
<td>218570 (18013104)</td>
</tr>
<tr>
<td>218552 (18013105)</td>
<td>218556 (18013106)</td>
<td>218501 (18013107)</td>
<td>218513 (18013108)</td>
</tr>
<tr>
<td>218506 (18013109)</td>
<td>218569 (18013111)</td>
<td>218560 (18013112)</td>
<td>218505 (18013113)</td>
</tr>
<tr>
<td>218559 (18013114)</td>
<td>218510 (18013118)</td>
<td>218574 (18013119)</td>
<td>218502 (18013121)</td>
</tr>
<tr>
<td>218500 (18013122)</td>
<td>218555 (18013124)</td>
<td>218589 (18013125)</td>
<td>218586 (18013126)</td>
</tr>
<tr>
<td>218503 (18013128)</td>
<td>218512 (18013130)</td>
<td>218550 (18013131)</td>
<td>218553 (18013132)</td>
</tr>
<tr>
<td>211559 (18032402)</td>
<td>216553 (18032406)</td>
<td>218146 (18033001)</td>
<td>218314 (19011901)</td>
</tr>
<tr>
<td>218315 (19011902)</td>
<td>219551 (19033105)</td>
<td>219582 (19033111)</td>
<td>219559 (19033120)</td>
</tr>
<tr>
<td>219557 (19033129)</td>
<td>219570 (19033136)</td>
<td>219505 (19033143)</td>
<td>219560 (19071508)</td>
</tr>
<tr>
<td>219579 (19071509)</td>
<td>220591 (19071513)</td>
<td>T0138 (20090138)</td>
<td>T0139 (20090139)</td>
</tr>
</tbody>
</table>

T0157 (20090157)
## Appendix B - Dry Day Regression Results

<table>
<thead>
<tr>
<th>ESN</th>
<th>Parameters</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\eta_{\text{trip}}$</td>
<td>$f_{ir}$</td>
</tr>
<tr>
<td>16032101</td>
<td>0.39</td>
<td>0.71</td>
</tr>
<tr>
<td>13081217</td>
<td>0.27</td>
<td>0.55</td>
</tr>
<tr>
<td>16041336</td>
<td>0.32</td>
<td>0.49</td>
</tr>
<tr>
<td>13081208</td>
<td>0.32</td>
<td>0.59</td>
</tr>
<tr>
<td>18013109</td>
<td>0.29</td>
<td>0.44</td>
</tr>
<tr>
<td>16041322</td>
<td>0.37</td>
<td>0.61</td>
</tr>
<tr>
<td>11080614</td>
<td>0.33</td>
<td>0.48</td>
</tr>
<tr>
<td>12122304</td>
<td>0.26</td>
<td>0.52</td>
</tr>
<tr>
<td>14050410</td>
<td>0.29</td>
<td>0.36</td>
</tr>
<tr>
<td>18013128</td>
<td>0.32</td>
<td>0.53</td>
</tr>
<tr>
<td>13041106</td>
<td>0.24</td>
<td>0.57</td>
</tr>
<tr>
<td>13051027</td>
<td>0.25</td>
<td>0.56</td>
</tr>
<tr>
<td>16091428</td>
<td>0.29</td>
<td>0.56</td>
</tr>
<tr>
<td>16041354</td>
<td>0.36</td>
<td>0.69</td>
</tr>
<tr>
<td>14120709</td>
<td>0.26</td>
<td>0.55</td>
</tr>
<tr>
<td>15031316</td>
<td>0.28</td>
<td>0.39</td>
</tr>
<tr>
<td>ESN</td>
<td>$\eta_{\text{trip}}$</td>
<td>$f_{\text{ir}}$</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>15022406</td>
<td>0.32</td>
<td>0.49</td>
</tr>
<tr>
<td>10111317</td>
<td>0.26</td>
<td>0.41</td>
</tr>
<tr>
<td>13072006</td>
<td>0.28</td>
<td>0.62</td>
</tr>
<tr>
<td>13072007</td>
<td>0.21</td>
<td>0.41</td>
</tr>
<tr>
<td>13041105</td>
<td>0.21</td>
<td>0.51</td>
</tr>
<tr>
<td>14050415</td>
<td>0.25</td>
<td>0.52</td>
</tr>
</tbody>
</table>

Table B.1 - SA Model Dry Day Regression Results
<table>
<thead>
<tr>
<th></th>
<th>0.34</th>
<th>0.70</th>
<th>0.01</th>
<th>0.71</th>
<th>0.76</th>
<th>3.95</th>
<th>3.35</th>
<th>24.29</th>
</tr>
</thead>
<tbody>
<tr>
<td>17123003</td>
<td>0.29</td>
<td>0.37</td>
<td>0.01</td>
<td>0.69</td>
<td>0.74</td>
<td>2.49</td>
<td>2.12</td>
<td>20.34</td>
</tr>
<tr>
<td>10052005</td>
<td>0.32</td>
<td>0.69</td>
<td>0.01</td>
<td>0.79</td>
<td>0.74</td>
<td>2.18</td>
<td>1.85</td>
<td>24.20</td>
</tr>
<tr>
<td>16041332</td>
<td>0.34</td>
<td>0.58</td>
<td>0.01</td>
<td>0.74</td>
<td>0.71</td>
<td>2.06</td>
<td>1.74</td>
<td>24.78</td>
</tr>
<tr>
<td>16041330</td>
<td>0.27</td>
<td>0.58</td>
<td>0.01</td>
<td>0.75</td>
<td>0.71</td>
<td>2.87</td>
<td>2.47</td>
<td>24.11</td>
</tr>
<tr>
<td>16091414</td>
<td>0.28</td>
<td>0.46</td>
<td>0.01</td>
<td>0.71</td>
<td>0.70</td>
<td>3.93</td>
<td>3.30</td>
<td>25.63</td>
</tr>
<tr>
<td>17123001</td>
<td>0.30</td>
<td>0.51</td>
<td>0.01</td>
<td>0.70</td>
<td>0.70</td>
<td>4.76</td>
<td>4.07</td>
<td>19.71</td>
</tr>
<tr>
<td>14050405</td>
<td>0.38</td>
<td>0.55</td>
<td>0.01</td>
<td>0.79</td>
<td>0.67</td>
<td>3.39</td>
<td>2.86</td>
<td>26.41</td>
</tr>
</tbody>
</table>

Table B.2 - TA Model Dry Day Regression Results
Idle events are reduced to high-activity days on a district-by-district, winter-by-winter basis. To be considered a high-activity day, the average number of hours per vehicle in the district must be at least seven, regardless of how many vehicles were active that day.

<table>
<thead>
<tr>
<th>Winter Date</th>
<th>District 1</th>
<th>District 2</th>
<th>District 3</th>
<th>District 4</th>
<th>District 5</th>
<th>District 6</th>
<th>District 7</th>
<th>District 8</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-12-02</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-12-27</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-12-28</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-12-31</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-01-18</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-01-22</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-01-28</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-01-29</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-01-30</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-01-31</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-05</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-06</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-07</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-08</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-09</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-10</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-12</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-20</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-21</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-23</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-24</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-25</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-02-26</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-03-01</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019-03-05</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

APPENDIX C - IDLING PATTERNS AT MnDOT FACILITIES
<table>
<thead>
<tr>
<th></th>
<th>District</th>
<th>Date</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2019-03-09</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2019-03-10</strong></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2019-04-10</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2019-04-11</strong></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>2019-04-12</strong></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table C.1a. High-activity days by district in winter one**
<table>
<thead>
<tr>
<th>Winter Date</th>
<th>District</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020-01-20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>2020-01-21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2020-01-22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-01-23</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-01-24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-01-30</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-02-09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-02-12</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-02-18</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2020-04-03</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-04-12</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-04-13</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table C.1b. High-activity days by district in winter two**

<table>
<thead>
<tr>
<th>Winter Date</th>
<th>District</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020-11-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-12-21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-12-23</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>2020-12-24</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>2020-12-25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-12-29</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020-12-30</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021-02-04</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>2021-02-05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021-02-17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021-02-21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021-02-24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021-02-28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021-03-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2021-03-11</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>2021-03-15</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**Table C.1c. High-activity days by district in winter three.**
Additionally, Appendix C includes the following maps of truck stations and other MnDOT facilities that include clusters of idle events over the two winters, with hours of idling and fuel consumption at the facility, as well as the share of events and values at the facility as a part of the district, and as a share of events at other MnDOT facilities.
Carlton Truck Station

5+ minute idles
Idle events: 10 (0% ID*, 0% ASID*)
Idle hours: 3.9 (0% ID, 1% ASID)
Fuel used: 3.5 gal (0% ID, 1% ASID)

15+ minute idles
Idle events: 7 (1% ID, 1% ASID)
Idle hours: 3.6 (1% ID, 1% ASID)
Fuel used: 3.3 gal (1% ID, 1% ASID)

30+ minute idles
Idle events: 2 (0% ID, 1% ASID)
Idle hours: 1.8 (0% ID, 1% ASID)
Fuel used: 1.6 gal (0% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.5
Carlton Truck Station

**5+ minute idles**
- Idle events: 3 (0% ID*, 0% ASID*)
- Idle hours: 1.3 (0% ID, 1% ASID)
- Fuel used: 1.2 gal (0% ID, 1% ASID)

**15+ minute idles**
- Idle events: 1 (0% ID, 1% ASID)
- Idle hours: 1.1 (1% ID, 1% ASID)
- Fuel used: 1 gal (1% ID, 1% ASID)

**30+ minute idles**
- Idle events: 1 (1% ID, 2% ASID)
- Idle hours: 1.1 (1% ID, 2% ASID)
- Fuel used: 1 gal (1% ID, 2% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.6
District HQ Duluth

5+ minute idles
Idle events: 388 (7% ID*, 13% ASID*)
Idle hours: 89.3 (7% ID, 14% ASID)
Fuel used: 71.2 gal (6% ID, 13% ASID)

15+ minute idles
Idle events: 96 (7% ID, 17% ASID)
Idle hours: 47.4 (7% ID, 15% ASID)
Fuel used: 40.2 gal (7% ID, 14% ASID)

30+ minute idles
Idle events: 31 (7% ID, 16% ASID)
Idle hours: 24.6 (6% ID, 13% ASID)
Fuel used: 23 gal (7% ID, 13% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.7
District HQ Duluth

### 5+ minute idles
- Idle events: 114 (6% ID*, 11% ASID*)
- Idle hours: 25.8 (6% ID, 12% ASID)
- Fuel used: 20.9 gal (6% ID, 11% ASID)

### 15+ minute idles
- Idle events: 28 (7% ID, 15% ASID)
- Idle hours: 13.9 (7% ID, 14% ASID)
- Fuel used: 11.8 gal (7% ID, 14% ASID)

### 30+ minute idles
- Idle events: 9 (8% ID, 15% ASID)
- Idle hours: 6.4 (6% ID, 11% ASID)
- Fuel used: 6.1 gal (7% ID, 12% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.8
Duluth Truck Station (Joint Use)

5+ minute idles
Idle events: 940 (16% ID*, 32% ASID*)
Idle hours: 205.6 (16% ID, 32% ASID)
Fuel used: 175 gal (16% ID, 31% ASID)

15+ minute idles
Idle events: 170 (13% ID, 29% ASID)
Idle hours: 102.7 (15% ID, 33% ASID)
Fuel used: 91 gal (15% ID, 31% ASID)

30+ minute idles
Idle events: 57 (13% ID, 29% ASID)
Idle hours: 64 (16% ID, 35% ASID)
Fuel used: 56.5 gal (17% ID, 33% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.9
Duluth Truck Station (Joint Use)

**IDLE EVENTS ON HIGH-ACTIVITY DAYS**

High-activity days are defined, per district, in this appendix.

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

**5+ minute idles**
- Idle events: 281 (15% ID*, 27% ASID*)
- Idle hours: 65.3 (16% ID, 30% ASID)
- Fuel used: 51.8 gal (15% ID, 28% ASID)

**15+ minute idles**
- Idle events: 50 (13% ID, 27% ASID)
- Idle hours: 34.1 (17% ID, 33% ASID)
- Fuel used: 27 gal (17% ID, 31% ASID)

**30+ minute idles**
- Idle events: 20 (18% ID, 33% ASID)
- Idle hours: 23.1 (22% ID, 38% ASID)
- Fuel used: 17.4 gal (21% ID, 35% ASID)

Imagery: MnGeo Composite Image Service for Minnesota
Ely Truck Station

5+ minute idles
Idle events: 13 (0% ID*, 0% ASID*)
Idle hours: 3.6 (0% ID, 1% ASID)
Fuel used: 3.1 gal (0% ID, 1% ASID)

15+ minute idles
Idle events: 4 (0% ID, 1% ASID)
Idle hours: 2.4 (0% ID, 1% ASID)
Fuel used: 2 gal (0% ID, 1% ASID)

30+ minute idles
Idle events: 2 (0% ID, 1% ASID)
Idle hours: 1.6 (0% ID, 1% ASID)
Fuel used: 1.3 gal (0% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.11
Idle events on High-Activity Days

Ely Truck Station

5+ minute idles
Idle events: 1 (0% ID*, 0% ASID*)
Idle hours: 0.1 (0% ID, 0% ASID)
Fuel used: 0.1 gal (0% ID, 0% ASID)

15+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.12
Grand Rapids Truck Station

5+ minute idles
Idle events: 245 (4% ID*, 8% ASID*)
Idle hours: 45 (3% ID, 7% ASID)
Fuel used: 43.3 gal (4% ID, 8% ASID)

15+ minute idles
Idle events: 37 (3% ID, 6% ASID)
Idle hours: 17.4 (2% ID, 6% ASID)
Fuel used: 19.5 gal (3% ID, 7% ASID)

30+ minute idles
Idle events: 13 (3% ID, 7% ASID)
Idle hours: 10 (2% ID, 5% ASID)
Fuel used: 12.8 gal (4% ID, 7% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.13
Grand Rapids Truck Station

5+ minute idles
Idle events: 105 (5% ID*, 10% ASID*)
Idle hours: 18.6 (5% ID, 9% ASID)
Fuel used: 18.5 gal (6% ID, 10% ASID)

15+ minute idles
Idle events: 15 (4% ID, 8% ASID)
Idle hours: 7.2 (4% ID, 7% ASID)
Fuel used: 8.3 gal (5% ID, 10% ASID)

30+ minute idles
Idle events: 5 (5% ID, 8% ASID)
Idle hours: 4.1 (4% ID, 7% ASID)
Fuel used: 4.9 gal (6% ID, 10% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.
International Falls Truck Station

5+ minute idles
Idle events: 129 (2% ID*, 4% ASID*)
Idle hours: 27.7 (2% ID, 4% ASID)
Fuel used: 23.2 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 25 (2% ID, 4% ASID)
Idle hours: 14 (2% ID, 4% ASID)
Fuel used: 10.9 gal (2% ID, 4% ASID)

30+ minute idles
Idle events: 9 (2% ID, 5% ASID)
Idle hours: 8.3 (2% ID, 5% ASID)
Fuel used: 6.2 gal (2% ID, 4% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.15
International Falls Truck Station

### 5+ minute idles
- Idle events: 53 (3% ID*, 5% ASID*)
- Idle hours: 14.6 (4% ID, 7% ASID)
- Fuel used: 11.3 gal (3% ID, 6% ASID)

### 15+ minute idles
- Idle events: 16 (4% ID, 9% ASID)
- Idle hours: 9.3 (5% ID, 9% ASID)
- Fuel used: 7 gal (4% ID, 8% ASID)

### 30+ minute idles
- Idle events: 6 (5% ID, 10% ASID)
- Idle hours: 5.6 (5% ID, 9% ASID)
- Fuel used: 3.9 gal (5% ID, 8% ASID)

*Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.
Moose Lake Truck Station

5+ minute idles
Idle events: 142 (2% ID*, 5% ASID*)
Idle hours: 34.9 (3% ID, 6% ASID)
Fuel used: 21.4 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 40 (3% ID, 7% ASID)
Idle hours: 19.5 (3% ID, 6% ASID)
Fuel used: 10.8 gal (2% ID, 4% ASID)

30+ minute idles
Idle events: 12 (3% ID, 6% ASID)
Idle hours: 11.8 (3% ID, 6% ASID)
Fuel used: 5.8 gal (2% ID, 3% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.17
Moose Lake Truck Station

**Idle Events on High-Activity Days**

5+ minute idles
Idle events: 84 (4% ID*, 8% ASID*)
Idle hours: 21.7 (5% ID, 10% ASID)
Fuel used: 13.2 gal (4% ID, 7% ASID)

15+ minute idles
Idle events: 23 (6% ID, 13% ASID)
Idle hours: 12.4 (6% ID, 12% ASID)
Fuel used: 6.7 gal (4% ID, 8% ASID)

30+ minute idles
Idle events: 8 (7% ID, 13% ASID)
Idle hours: 8.5 (8% ID, 14% ASID)
Fuel used: 4.2 gal (5% ID, 8% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.18
Nopeming Truck Station

5+ minute idles
Idle events: 419 (7% ID*, 14% ASID*)
Idle hours: 85.6 (7% ID, 13% ASID)
Fuel used: 79.9 gal (7% ID, 14% ASID)

15+ minute idles
Idle events: 70 (5% ID, 12% ASID)
Idle hours: 39.6 (6% ID, 13% ASID)
Fuel used: 38.6 gal (7% ID, 13% ASID)

30+ minute idles
Idle events: 28 (6% ID, 14% ASID)
Idle hours: 24.9 (6% ID, 13% ASID)
Fuel used: 24.2 gal (7% ID, 14% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.19
Nopeming Truck Station

5+ minute idles
Idle events: 160 (8% ID*, 16% ASID*)
Idle hours: 26.6 (7% ID, 12% ASID)
Fuel used: 22.1 gal (7% ID, 12% ASID)

15+ minute idles
Idle events: 14 (4% ID, 8% ASID)
Idle hours: 7.6 (4% ID, 7% ASID)
Fuel used: 6.4 gal (4% ID, 7% ASID)

30+ minute idles
Idle events: 4 (4% ID, 7% ASID)
Idle hours: 4.2 (4% ID, 7% ASID)
Fuel used: 3.8 gal (5% ID, 8% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Appendix C.20

Imagery: MnGeo Composite Image Service for Minnesota
Virginia Truck Station

5+ minute idles
Idle events: 659 (11% ID*, 22% ASID*)
Idle hours: 136 (10% ID, 21% ASID)
Fuel used: 140.8 gal (13% ID, 25% ASID)

15+ minute idles
Idle events: 128 (10% ID, 22% ASID)
Idle hours: 67.7 (10% ID, 22% ASID)
Fuel used: 73 gal (12% ID, 25% ASID)

30+ minute idles
Idle events: 41 (9% ID, 21% ASID)
Idle hours: 37.3 (9% ID, 20% ASID)
Fuel used: 40.9 gal (12% ID, 24% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.21
Virginia Truck Station

**5+ minute idles**
- Idle events: 227 (12% ID*, 22% ASID*)
- Idle hours: 42.6 (10% ID, 20% ASID)
- Fuel used: 45 gal (13% ID, 24% ASID)

**15+ minute idles**
- Idle events: 35 (9% ID, 19% ASID)
- Idle hours: 17 (9% ID, 17% ASID)
- Fuel used: 18.1 gal (11% ID, 21% ASID)

**30+ minute idles**
- Idle events: 8 (7% ID, 13% ASID)
- Idle hours: 7.4 (7% ID, 12% ASID)
- Fuel used: 8.3 gal (10% ID, 17% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.22
Bagley Truck Station

5+ minute idles
Idle events: 10 (1% ID*, 1% ASID*)
Idle hours: 2.4 (1% ID, 1% ASID)
Fuel used: 1.9 gal (1% ID, 1% ASID)

15+ minute idles
Idle events: 5 (2% ID, 3% ASID)
Idle hours: 1.8 (1% ID, 3% ASID)
Fuel used: 1.5 gal (1% ID, 2% ASID)

30+ minute idles
Idle events: 1 (2% ID, 3% ASID)
Idle hours: 0.6 (1% ID, 2% ASID)
Fuel used: 0.6 gal (2% ID, 3% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.
Bagley Truck Station

**5+ minute idles**
Idle events: 1 (0% ID*, 1% ASID*)
Idle hours: 0.1 (0% ID, 0% ASID)
Fuel used: 0.1 gal (0% ID, 0% ASID)

**15+ minute idles**
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

**30+ minute idles**
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.24
5+ minute idles
Idle events: 80 (4% ID*, 8% ASID*)
Idle hours: 16.3 (5% ID, 9% ASID)
Fuel used: 13 gal (5% ID, 9% ASID)

15+ minute idles
Idle events: 18 (6% ID, 10% ASID)
Idle hours: 8.1 (6% ID, 11% ASID)
Fuel used: 6.8 gal (7% ID, 11% ASID)

30+ minute idles
Idle events: 6 (9% ID, 17% ASID)
Idle hours: 4.4 (9% ID, 17% ASID)
Fuel used: 3.7 gal (9% ID, 16% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.25
High-activity days are defined, per district, in this appendix.
5+ minute idles
Idle events: 23 (1% ID*, 2% ASID*)
Idle hours: 6.1 (2% ID, 3% ASID)
Fuel used: 5.3 gal (2% ID, 3% ASID)

15+ minute idles
Idle events: 8 (3% ID, 4% ASID)
Idle hours: 4.3 (3% ID, 6% ASID)
Fuel used: 3 gal (3% ID, 5% ASID)

30+ minute idles
Idle events: 5 (8% ID, 14% ASID)
Idle hours: 3.3 (7% ID, 13% ASID)
Fuel used: 2.1 gal (5% ID, 9% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota
5+ minute idles
Idle events: 10 (3% ID*, 7% ASID*)
Idle hours: 2.1 (4% ID, 7% ASID)
Fuel used: 2.2 gal (5% ID, 9% ASID)

15+ minute idles
Idle events: 3 (7% ID, 9% ASID)
Idle hours: 1.3 (7% ID, 10% ASID)
Fuel used: 1.1 gal (7% ID, 10% ASID)

30+ minute idles
Idle events: 1 (9% ID, 11% ASID)
Idle hours: 0.5 (7% ID, 9% ASID)
Fuel used: 0.3 gal (5% ID, 6% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.
Erskine Truck Station

5+ minute idles
Idle events: 97 (5% ID*, 10% ASID*)
Idle hours: 18.5 (5% ID, 10% ASID)
Fuel used: 15.6 gal (6% ID, 10% ASID)

15+ minute idles
Idle events: 16 (5% ID, 9% ASID)
Idle hours: 7.5 (6% ID, 10% ASID)
Fuel used: 6 gal (6% ID, 9% ASID)

30+ minute idles
Idle events: 5 (8% ID, 14% ASID)
Idle hours: 3.6 (8% ID, 14% ASID)
Fuel used: 2.9 gal (7% ID, 13% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.29
Erskine Truck Station

**IDLE EVENTS ON HIGH-ACTIVITY DAYS**

5+ minute idles
- Idle events: 21 (7% ID*, 14% ASID*)
- Idle hours: 4.6 (9% ID, 16% ASID)
- Fuel used: 4.1 gal (9% ID, 16% ASID)

15+ minute idles
- Idle events: 5 (12% ID, 16% ASID)
- Idle hours: 2.6 (15% ID, 20% ASID)
- Fuel used: 2.1 gal (14% ID, 19% ASID)

30+ minute idles
- Idle events: 3 (27% ID, 33% ASID)
- Idle hours: 1.9 (26% ID, 33% ASID)
- Fuel used: 1.5 gal (25% ID, 33% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.30
Maintenance HQ, Crookston

**5+ minute idles**

Idle events: 222 (11% ID*, 23% ASID*)
Idle hours: 39.1 (11% ID, 21% ASID)
Fuel used: 46.2 gal (16% ID, 30% ASID)

**15+ minute idles**

Idle events: 38 (12% ID, 20% ASID)
Idle hours: 15.5 (12% ID, 21% ASID)
Fuel used: 17.7 gal (17% ID, 28% ASID)

**30+ minute idles**

Idle events: 7 (11% ID, 20% ASID)
Idle hours: 4.5 (10% ID, 18% ASID)
Fuel used: 4.7 gal (12% ID, 20% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.31
Idle events on High-Activity Days

Maintenance HQ, Crookston

5+ minute idles
Idle events: 40 (14% ID*, 27% ASID*)
Idle hours: 8 (15% ID, 27% ASID)
Fuel used: 9.1 gal (21% ID, 36% ASID)

15+ minute idles
Idle events: 9 (21% ID, 28% ASID)
Idle hours: 3.8 (22% ID, 29% ASID)
Fuel used: 4.2 gal (27% ID, 37% ASID)

30+ minute idles
Idle events: 2 (18% ID, 22% ASID)
Idle hours: 1.2 (17% ID, 22% ASID)
Fuel used: 1.1 gal (17% ID, 22% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.32
Northome Truck Station

5+ minute idles
Idle events: 25 (1% ID*, 3% ASID*)
Idle hours: 5.3 (2% ID, 3% ASID)
Fuel used: 5.4 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 7 (2% ID, 4% ASID)
Idle hours: 3.1 (2% ID, 4% ASID)
Fuel used: 3.1 gal (3% ID, 5% ASID)

30+ minute idles
Idle events: 2 (3% ID, 6% ASID)
Idle hours: 1.4 (3% ID, 6% ASID)
Fuel used: 1.1 gal (3% ID, 5% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.33
Northome Truck Station

IDLE EVENTS ON HIGH-ACTIVITY DAYS

5+ minute idles
Idle events: 8 (3% ID*, 5% ASID*)
Idle hours: 2.3 (4% ID, 8% ASID)
Fuel used: 1.8 gal (4% ID, 7% ASID)

15+ minute idles
Idle events: 4 (9% ID, 13% ASID)
Idle hours: 1.8 (10% ID, 14% ASID)
Fuel used: 1.4 gal (9% ID, 12% ASID)

30+ minute idles
Idle events: 1 (9% ID, 11% ASID)
Idle hours: 0.8 (11% ID, 15% ASID)
Fuel used: 0.7 gal (11% ID, 14% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.34
Park Rapids Truck Station

5+ minute idles
Idle events: 37 (2% ID*, 4% ASID*)
Idle hours: 7.9 (2% ID, 4% ASID)
Fuel used: 7.2 gal (3% ID, 5% ASID)

15+ minute idles
Idle events: 12 (4% ID, 6% ASID)
Idle hours: 4 (3% ID, 6% ASID)
Fuel used: 4.8 gal (5% ID, 8% ASID)

30+ minute idles
Idle events: 1 (2% ID, 3% ASID)
Idle hours: 1.1 (2% ID, 4% ASID)
Fuel used: 2.7 gal (7% ID, 12% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.35
Park Rapids Truck Station

5+ minute idles
Idle events: 8 (3% ID*, 5% ASID*)
Idle hours: 1.6 (3% ID, 6% ASID)
Fuel used: 1 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 4 (9% ID, 13% ASID)
Idle hours: 1 (6% ID, 8% ASID)
Fuel used: 0.7 gal (4% ID, 6% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.36
Thief River Falls Truck Station (Joint Use)

5+ minute idles
Idle events: 223 (11% ID*, 23% ASID*)
Idle hours: 41.7 (12% ID, 23% ASID)
Fuel used: 26.2 gal (9% ID, 17% ASID)

15+ minute idles
Idle events: 28 (9% ID, 15% ASID)
Idle hours: 11.5 (9% ID, 16% ASID)
Fuel used: 8.6 gal (8% ID, 14% ASID)

30+ minute idles
Idle events: 6 (9% ID, 17% ASID)
Idle hours: 4.8 (10% ID, 19% ASID)
Fuel used: 4 gal (10% ID, 18% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.37
DISTRICT 2: IDLE EVENTS ON HIGH-ACTIVITY DAYS

Thief River Falls Truck Station (Joint Use)

5+ minute idles
Idle events: 32 (11% ID*, 22% ASID*)
Idle hours: 5.7 (11% ID, 20% ASID)
Fuel used: 3.4 gal (8% ID, 13% ASID)

15+ minute idles
Idle events: 4 (9% ID, 13% ASID)
Idle hours: 1.1 (6% ID, 8% ASID)
Fuel used: 0.6 gal (4% ID, 5% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.38
Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.
Walker Truck Station

### Idle Events on High-Activity Days

**5+ minute idles**
- Idle events: 19 (7% ID*, 13% ASID*)
- Idle hours: 2.6 (5% ID, 9% ASID)
- Fuel used: 1.8 gal (4% ID, 7% ASID)

**15+ minute idles**
- Idle events: 1 (2% ID, 3% ASID)
- Idle hours: 0.3 (2% ID, 2% ASID)
- Fuel used: 0.1 gal (1% ID, 1% ASID)

**30+ minute idles**
- Idle events: 0 (0% ID, 0% ASID)
- Idle hours: 0 (0% ID, 0% ASID)
- Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.40
Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

5+ minute idles
Idle events: 206 (5% ID*, 12% ASID*)
Idle hours: 34.6 (3% ID, 6% ASID)
Fuel used: 22.3 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 35 (3% ID, 6% ASID)
Idle hours: 11.6 (2% ID, 3% ASID)
Fuel used: 7.8 gal (1% ID, 2% ASID)

30+ minute idles
Idle events: 1 (0% ID, 0% ASID)
Idle hours: 0.5 (0% ID, 0% ASID)
Fuel used: 0.4 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.41
Cambridge Truck Station

**5+ minute idles**
- Idle events: 60 (9% ID*, 18% ASID*)
- Idle hours: 9.5 (8% ID, 14% ASID)
- Fuel used: 6.4 gal (5% ID, 9% ASID)

**15+ minute idles**
- Idle events: 8 (7% ID, 11% ASID)
- Idle hours: 2.8 (6% ID, 9% ASID)
- Fuel used: 1.9 gal (4% ID, 6% ASID)

**30+ minute idles**
- Idle events: 1 (5% ID, 7% ASID)
- Idle hours: 0.5 (3% ID, 4% ASID)
- Fuel used: 0.4 gal (2% ID, 3% ASID)

---

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.42
Elk River Truck Station

5+ minute idles
Idle events: 207 (5% ID*, 12% ASID*)
Idle hours: 68.8 (6% ID, 12% ASID)
Fuel used: 79.1 gal (6% ID, 13% ASID)

15+ minute idles
Idle events: 77 (6% ID, 14% ASID)
Idle hours: 50.6 (7% ID, 13% ASID)
Fuel used: 59.4 gal (8% ID, 13% ASID)

30+ minute idles
Idle events: 42 (9% ID, 16% ASID)
Idle hours: 38.1 (8% ID, 13% ASID)
Fuel used: 45.1 gal (8% ID, 13% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.43
Elk River Truck Station

5+ minute idles
Idle events: 35 (5% ID*, 11% ASID*)
Idle hours: 7.8 (6% ID, 12% ASID)
Fuel used: 6.3 gal (5% ID, 9% ASID)

15+ minute idles
Idle events: 7 (6% ID, 10% ASID)
Idle hours: 4.1 (8% ID, 13% ASID)
Fuel used: 3 gal (6% ID, 9% ASID)

30+ minute idles
Idle events: 4 (18% ID, 29% ASID)
Idle hours: 3 (15% ID, 26% ASID)
Fuel used: 2.3 gal (12% ID, 19% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.44
Isle Truck Station

5+ minute idles
Idle events: 170 (4% ID*, 10% ASID*)
Idle hours: 34.5 (3% ID, 6% ASID)
Fuel used: 27.5 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 46 (4% ID, 8% ASID)
Idle hours: 15.6 (2% ID, 4% ASID)
Fuel used: 12.3 gal (2% ID, 3% ASID)

30+ minute idles
Idle events: 7 (1% ID, 3% ASID)
Idle hours: 4.6 (1% ID, 2% ASID)
Fuel used: 4 gal (1% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.45
Isle Truck Station

**IDLE EVENTS ON HIGH-ACTIVITY DAYS**

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

### 5+ minute idles
- Idle events: 41 (6% ID*, 12% ASID*)
- Idle hours: 7.4 (6% ID, 11% ASID)
- Fuel used: 5.7 gal (5% ID, 8% ASID)

### 15+ minute idles
- Idle events: 8 (7% ID, 11% ASID)
- Idle hours: 2.3 (5% ID, 7% ASID)
- Fuel used: 1.6 gal (3% ID, 5% ASID)

### 30+ minute idles
- Idle events: 0 (0% ID, 0% ASID)
- Idle hours: 0 (0% ID, 0% ASID)
- Fuel used: 0 gal (0% ID, 0% ASID)

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.46
5+ minute idles
Idle events: 409 (9% ID*, 23% ASID*)
Idle hours: 122.7 (10% ID, 22% ASID)
Fuel used: 156.7 gal (13% ID, 25% ASID)

15+ minute idles
Idle events: 123 (10% ID, 22% ASID)
Idle hours: 85.2 (12% ID, 21% ASID)
Fuel used: 106.7 gal (14% ID, 24% ASID)

30+ minute idles
Idle events: 63 (13% ID, 24% ASID)
Idle hours: 64.4 (13% ID, 21% ASID)
Fuel used: 79.8 gal (15% ID, 24% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota
### Milaca Truck Station

#### IDLE EVENTS ON HIGH-ACTIVITY DAYS

- **5+ minute idles**
  - Idle events: 99 (15% ID*, 30% ASID*)
  - Idle hours: 18.2 (15% ID, 27% ASID)
  - Fuel used: 24 gal (20% ID, 35% ASID)

- **15+ minute idles**
  - Idle events: 20 (18% ID, 28% ASID)
  - Idle hours: 7.4 (15% ID, 24% ASID)
  - Fuel used: 10 gal (20% ID, 31% ASID)

- **30+ minute idles**
  - Idle events: 1 (5% ID, 7% ASID)
  - Idle hours: 0.6 (3% ID, 5% ASID)
  - Fuel used: 0.7 gal (4% ID, 6% ASID)

---

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

---

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.48
Monticello Truck Station

5+ minute idles
Idle events: 108 (2% ID*, 6% ASID*)
Idle hours: 25.5 (2% ID, 5% ASID)
Fuel used: 30 gal (2% ID, 5% ASID)

15+ minute idles
Idle events: 30 (3% ID, 5% ASID)
Idle hours: 15.1 (2% ID, 4% ASID)
Fuel used: 19.2 gal (2% ID, 4% ASID)

30+ minute idles
Idle events: 9 (2% ID, 3% ASID)
Idle hours: 8 (2% ID, 3% ASID)
Fuel used: 11 gal (2% ID, 3% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.49
Monticello Truck Station

**5+ minute idles**
- Idle events: 30 (5% ID*, 9% ASID*)
- Idle hours: 6.7 (5% ID, 10% ASID)
- Fuel used: 8.3 gal (7% ID, 12% ASID)

**15+ minute idles**
- Idle events: 11 (10% ID, 15% ASID)
- Idle hours: 3.9 (8% ID, 13% ASID)
- Fuel used: 5.1 gal (10% ID, 16% ASID)

**30+ minute idles**
- Idle events: 1 (5% ID, 7% ASID)
- Idle hours: 0.6 (3% ID, 5% ASID)
- Fuel used: 0.8 gal (4% ID, 7% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.50
Mora Truck Station

5+ minute idles
Idle events: 132 (3% ID*, 7% ASID*)
Idle hours: 21.5 (2% ID, 4% ASID)
Fuel used: 17.6 gal (1% ID, 3% ASID)

15+ minute idles
Idle events: 22 (2% ID, 4% ASID)
Idle hours: 6.4 (1% ID, 2% ASID)
Fuel used: 5.1 gal (1% ID, 1% ASID)

30+ minute idles
Idle events: 1 (0% ID, 0% ASID)
Idle hours: 0.7 (0% ID, 0% ASID)
Fuel used: 0.4 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.51
Mora Truck Station

5+ minute idles
Idle events: 24 (4% ID*, 7% ASID*)
Idle hours: 3.6 (3% ID, 5% ASID)
Fuel used: 2.7 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 3 (3% ID, 4% ASID)
Idle hours: 0.8 (2% ID, 3% ASID)
Fuel used: 0.5 gal (1% ID, 2% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.52
5+ minute idles
Idle events: 314 (7% ID*, 18% ASID*)
Idle hours: 131.3 (11% ID, 23% ASID)
Fuel used: 157.9 gal (13% ID, 26% ASID)

15+ minute idles
Idle events: 140 (12% ID, 25% ASID)
Idle hours: 106.8 (15% ID, 27% ASID)
Fuel used: 130.1 gal (17% ID, 29% ASID)

30+ minute idles
Idle events: 81 (17% ID, 31% ASID)
Idle hours: 87.3 (18% ID, 29% ASID)
Fuel used: 106.8 gal (20% ID, 32% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.53
**Sauk Centre Truck Station**

**5+ minute idles**
- Idle events: 43 (6% ID*, 13% ASID*)
- Idle hours: 13.6 (11% ID, 20% ASID)
- Fuel used: 15.6 gal (13% ID, 23% ASID)

**15+ minute idles**
- Idle events: 14 (13% ID, 20% ASID)
- Idle hours: 9.2 (19% ID, 30% ASID)
- Fuel used: 10.6 gal (21% ID, 32% ASID)

**30+ minute idles**
- Idle events: 7 (32% ID, 50% ASID)
- Idle hours: 7 (35% ID, 59% ASID)
- Fuel used: 7.9 gal (42% ID, 65% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.54
Alexandria Truck Station

**5+ minute idles**
Idle events: 119 (6% ID*, 14% ASID*)
Idle hours: 35.7 (7% ID, 12% ASID)
Fuel used: 29.4 gal (6% ID, 10% ASID)

**15+ minute idles**
Idle events: 58 (11% ID, 19% ASID)
Idle hours: 26.8 (8% ID, 13% ASID)
Fuel used: 22.1 gal (7% ID, 10% ASID)

**30+ minute idles**
Idle events: 15 (7% ID, 10% ASID)
Idle hours: 12.4 (6% ID, 8% ASID)
Fuel used: 10.6 gal (5% ID, 6% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.55
Alexandria Truck Station

5+ minute idles
Idle events: 25 (7% ID*, 16% ASID*)
Idle hours: 6.8 (9% ID, 19% ASID)
Fuel used: 5.4 gal (8% ID, 16% ASID)

15+ minute idles
Idle events: 14 (20% ID, 37% ASID)
Idle hours: 5.3 (17% ID, 28% ASID)
Fuel used: 4.2 gal (16% ID, 26% ASID)

30+ minute idles
Idle events: 3 (21% ID, 30% ASID)
Idle hours: 1.5 (13% ID, 16% ASID)
Fuel used: 1.1 gal (12% ID, 15% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.
Idle events: 38 (2% ID*, 4% ASID*)
Idle hours: 22.8 (4% ID, 8% ASID)
Fuel used: 16.2 gal (3% ID, 5% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.
District HQ, Detroit Lakes

5+ minute idles
Idle events: 4 (1% ID*, 3% ASID*)
Idle hours: 5.2 (7% ID, 14% ASID)
Fuel used: 3.1 gal (5% ID, 9% ASID)

15+ minute idles
Idle events: 3 (4% ID, 8% ASID)
Idle hours: 5.1 (17% ID, 27% ASID)
Fuel used: 3 gal (11% ID, 19% ASID)

30+ minute idles
Idle events: 2 (14% ID, 20% ASID)
Idle hours: 4.8 (40% ID, 50% ASID)
Fuel used: 2.9 gal (31% ID, 40% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.58
Evansville Truck Station

5+ minute idles
Idle events: 51 (3% ID*, 6% ASID*)
Idle hours: 22.3 (4% ID, 8% ASID)
Fuel used: 20.1 gal (4% ID, 7% ASID)

15+ minute idles
Idle events: 25 (5% ID, 8% ASID)
Idle hours: 18.4 (6% ID, 9% ASID)
Fuel used: 16.4 gal (5% ID, 8% ASID)

30+ minute idles
Idle events: 15 (7% ID, 10% ASID)
Idle hours: 14.5 (7% ID, 9% ASID)
Fuel used: 13.3 gal (6% ID, 8% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.59
Evansville Truck Station

**5+ minute idles**
- Idle events: 4 (1% ID*, 3% ASID*)
- Idle hours: 1.2 (2% ID, 3% ASID)
- Fuel used: 0.8 gal (1% ID, 3% ASID)

**15+ minute idles**
- Idle events: 2 (3% ID, 5% ASID)
- Idle hours: 0.9 (3% ID, 5% ASID)
- Fuel used: 0.6 gal (2% ID, 4% ASID)

**30+ minute idles**
- Idle events: 0 (0% ID, 0% ASID)
- Idle hours: 0 (0% ID, 0% ASID)
- Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.60
Fergus Falls Truck Station

5+ minute idles
Idle events: 482 (25% ID*, 55% ASID*)
Idle hours: 166.9 (32% ID, 57% ASID)
Fuel used: 186 gal (37% ID, 63% ASID)

15+ minute idles
Idle events: 161 (30% ID, 52% ASID)
Idle hours: 121.2 (37% ID, 58% ASID)
Fuel used: 138.6 gal (43% ID, 64% ASID)

30+ minute idles
Idle events: 86 (40% ID, 59% ASID)
Idle hours: 96.3 (44% ID, 62% ASID)
Fuel used: 113 gal (50% ID, 69% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.61
Fergus Falls Truck Station

IDLE EVENTS ON HIGH-ACTIVITY DAYS

5+ minute idles
Idle events: 73 (19% ID*, 46% ASID*)
Idle hours: 13.6 (18% ID, 38% ASID)
Fuel used: 14.7 gal (22% ID, 45% ASID)

15+ minute idles
Idle events: 11 (16% ID, 29% ASID)
Idle hours: 4.7 (15% ID, 25% ASID)
Fuel used: 5.1 gal (19% ID, 32% ASID)

30+ minute idles
Idle events: 4 (29% ID, 40% ASID)
Idle hours: 2.8 (23% ID, 29% ASID)
Fuel used: 2.8 gal (31% ID, 39% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.62
Henning Truck Station

5+ minute idles
Idle events: 186 (10% ID*, 21% ASID*)
Idle hours: 44.2 (9% ID, 15% ASID)
Fuel used: 43.8 gal (9% ID, 15% ASID)

15+ minute idles
Idle events: 40 (8% ID, 13% ASID)
Idle hours: 22.4 (7% ID, 11% ASID)
Fuel used: 23.5 gal (7% ID, 11% ASID)

30+ minute idles
Idle events: 16 (7% ID, 11% ASID)
Idle hours: 14.3 (7% ID, 9% ASID)
Fuel used: 15.3 gal (7% ID, 9% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.63
Henning Truck Station

**5+ minute idles**
- Idle events: 51 (14% ID*, 32% ASID*)
- Idle hours: 9.3 (13% ID, 26% ASID)
- Fuel used: 8.9 gal (13% ID, 27% ASID)

**15+ minute idles**
- Idle events: 8 (11% ID, 21% ASID)
- Idle hours: 2.7 (9% ID, 15% ASID)
- Fuel used: 2.9 gal (11% ID, 18% ASID)

**30+ minute idles**
- Idle events: 1 (7% ID, 10% ASID)
- Idle hours: 0.5 (5% ID, 6% ASID)
- Fuel used: 0.4 gal (5% ID, 6% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.
Albert Lea Truck Station

5+ minute idles
Idle events: 207 (5% ID*, 12% ASID*)
Idle hours: 62.4 (6% ID, 14% ASID)
Fuel used: 60.6 gal (7% ID, 15% ASID)

15+ minute idles
Idle events: 66 (6% ID, 16% ASID)
Idle hours: 43.5 (7% ID, 16% ASID)
Fuel used: 41.4 gal (7% ID, 16% ASID)

30+ minute idles
 Idle events: 29 (6% ID, 16% ASID)
Idle hours: 29.8 (7% ID, 15% ASID)
Fuel used: 28.4 gal (7% ID, 15% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota
Albert Lea Truck Station

Idle events on high-activity days

5+ minute idles
Idle events: 88 (6% ID*, 12% ASID*)
Idle hours: 17.3 (5% ID, 10% ASID)
Fuel used: 16.9 gal (6% ID, 11% ASID)

15+ minute idles
Idle events: 18 (6% ID, 12% ASID)
Idle hours: 7.9 (5% ID, 9% ASID)
Fuel used: 7.5 gal (5% ID, 9% ASID)

30+ minute idles
Idle events: 3 (3% ID, 5% ASID)
Idle hours: 2.4 (2% ID, 4% ASID)
Fuel used: 2.2 gal (2% ID, 4% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.66
Caledonia Truck Station

5+ minute idles
Idle events: 226 (5% ID*, 13% ASID*)
Idle hours: 58.3 (6% ID, 13% ASID)
Fuel used: 60 gal (6% ID, 15% ASID)

15+ minute idles
Idle events: 58 (6% ID, 14% ASID)
Idle hours: 36.6 (6% ID, 13% ASID)
Fuel used: 37.3 gal (7% ID, 15% ASID)

30+ minute idles
Idle events: 28 (6% ID, 15% ASID)
Idle hours: 25.8 (6% ID, 13% ASID)
Fuel used: 26.4 gal (7% ID, 14% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.67
Caledonia Truck Station

**5+ minute idles**
- Idle events: 111 (7% ID*, 15% ASID*)
- Idle hours: 27.8 (8% ID, 16% ASID)
- Fuel used: 29.5 gal (10% ID, 20% ASID)

**15+ minute idles**
- Idle events: 26 (9% ID, 18% ASID)
- Idle hours: 16.8 (10% ID, 19% ASID)
- Fuel used: 18.1 gal (12% ID, 23% ASID)

**30+ minute idles**
- Idle events: 11 (9% ID, 18% ASID)
- Idle hours: 11.4 (11% ID, 19% ASID)
- Fuel used: 12.5 gal (13% ID, 23% ASID)

---

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.68
Owatonna Truck Station

5+ minute idles
Idle events: 7 (0% ID*, 0% ASID*)
Idle hours: 1.2 (0% ID, 0% ASID)
Fuel used: 1.4 gal (0% ID, 0% ASID)

15+ minute idles
Idle events: 1 (0% ID, 0% ASID)
Idle hours: 0.3 (0% ID, 0% ASID)
Fuel used: 0.5 gal (0% ID, 0% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.
Owatonna Truck Station

5+ minute idles
Idle events: 1 (0% ID*, 0% ASID*)
Idle hours: 0.2 (0% ID, 0% ASID)
Fuel used: 0.2 gal (0% ID, 0% ASID)

15+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.70
Rochester Truck Station (Multi Use)

5+ minute idles
Idle events: 291 (7% ID*, 17% ASID*)
Idle hours: 56 (5% ID, 12% ASID)
Fuel used: 50.5 gal (5% ID, 12% ASID)

15+ minute idles
Idle events: 49 (5% ID, 12% ASID)
Idle hours: 24.8 (4% ID, 9% ASID)
Fuel used: 23.5 gal (4% ID, 9% ASID)

30+ minute idles
Idle events: 11 (2% ID, 6% ASID)
Idle hours: 11.9 (3% ID, 6% ASID)
Fuel used: 10.9 gal (3% ID, 6% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.71
**District 6: Idle Events on High-Activity Days**

Rochester Truck Station (Multi Use)

5+ minute idles
- Idle events: 142 (9% ID*, 19% ASID*)
- Idle hours: 21.6 (7% ID, 13% ASID)
- Fuel used: 17.3 gal (6% ID, 12% ASID)

15+ minute idles
- Idle events: 12 (4% ID, 8% ASID)
- Idle hours: 5.3 (3% ID, 6% ASID)
- Fuel used: 4 gal (3% ID, 5% ASID)

30+ minute idles
- Idle events: 2 (2% ID, 3% ASID)
- Idle hours: 2 (2% ID, 3% ASID)
- Fuel used: 1.5 gal (2% ID, 3% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.72
Stewartville Truck Station

5+ minute idles
Idle events: 201 (5% ID*, 12% ASID*)
Idle hours: 33.9 (3% ID, 8% ASID)
Fuel used: 22.9 gal (2% ID, 6% ASID)

15+ minute idles
Idle events: 25 (2% ID, 6% ASID)
Idle hours: 9.3 (1% ID, 3% ASID)
Fuel used: 6.3 gal (1% ID, 2% ASID)

30+ minute idles
Idle events: 2 (0% ID, 1% ASID)
Idle hours: 2.3 (1% ID, 1% ASID)
Fuel used: 1.6 gal (0% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.73
Stewartville Truck Station

**Idle Events on High-Activity Days**

### 5+ minute idles
- Idle events: 110 (7% ID*, 14% ASID*)
- Idle hours: 18.7 (6% ID, 11% ASID)
- Fuel used: 11.3 gal (4% ID, 8% ASID)

### 15+ minute idles
- Idle events: 15 (5% ID, 10% ASID)
- Idle hours: 5.4 (3% ID, 6% ASID)
- Fuel used: 3.1 gal (2% ID, 4% ASID)

### 30+ minute idles
- Idle events: 1 (1% ID, 2% ASID)
- Idle hours: 1.2 (1% ID, 2% ASID)
- Fuel used: 0.6 gal (1% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.74
5+ minute idles
Idle events: 418 (10% ID*, 25% ASID*)
Idle hours: 157.5 (15% ID, 35% ASID)
Fuel used: 136 gal (15% ID, 33% ASID)

15+ minute idles
Idle events: 126 (12% ID, 31% ASID)
Idle hours: 118.6 (19% ID, 43% ASID)
Fuel used: 101.5 gal (18% ID, 40% ASID)

30+ minute idles
Idle events: 84 (18% ID, 45% ASID)
Idle hours: 104 (24% ID, 52% ASID)
Fuel used: 88.4 gal (22% ID, 48% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.75
Wabasha Truck Station

5+ minute idles
Idle events: 191 (12% ID*, 25% ASID*)
Idle hours: 61.4 (18% ID, 36% ASID)
Fuel used: 53 gal (19% ID, 35% ASID)

15+ minute idles
Idle events: 56 (18% ID, 38% ASID)
Idle hours: 43.2 (25% ID, 48% ASID)
Fuel used: 36.5 gal (25% ID, 46% ASID)

30+ minute idles
Idle events: 35 (30% ID, 56% ASID)
Idle hours: 35.4 (33% ID, 59% ASID)
Fuel used: 30.1 gal (32% ID, 56% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.76
Winona Truck Station

5+ minute idles
Idle events: 224 (5% ID*, 13% ASID*)
Idle hours: 51.4 (5% ID, 11% ASID)
Fuel used: 45 gal (5% ID, 11% ASID)

15+ minute idles
Idle events: 54 (5% ID, 13% ASID)
Idle hours: 28.4 (4% ID, 10% ASID)
Fuel used: 24.1 gal (4% ID, 10% ASID)

30+ minute idles
Idle events: 17 (4% ID, 9% ASID)
Idle hours: 15.3 (3% ID, 8% ASID)
Fuel used: 13.1 gal (3% ID, 7% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.77
Winona Truck Station

5+ minute idles
Idle events: 120 (8% ID*, 16% ASID*)
Idle hours: 25.1 (8% ID, 15% ASID)
Fuel used: 22.4 gal (8% ID, 15% ASID)

15+ minute idles
Idle events: 21 (7% ID, 14% ASID)
Idle hours: 12 (7% ID, 13% ASID)
Fuel used: 10.5 gal (7% ID, 13% ASID)

30+ minute idles
Idle events: 10 (8% ID, 16% ASID)
Idle hours: 8 (8% ID, 13% ASID)
Fuel used: 7.1 gal (8% ID, 13% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.78
Le Sueur Truck Station

5+ minute idles
Idle events: 73 (4% ID*, 9% ASID*)
Idle hours: 20.3 (5% ID, 11% ASID)
Fuel used: 24.3 gal (5% ID, 11% ASID)

15+ minute idles
Idle events: 22 (6% ID, 13% ASID)
Idle hours: 13 (6% ID, 13% ASID)
Fuel used: 15.9 gal (6% ID, 13% ASID)

30+ minute idles
Idle events: 8 (6% ID, 13% ASID)
Idle hours: 8.3 (6% ID, 13% ASID)
Fuel used: 9.8 gal (5% ID, 12% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.79
Le Sueur Truck Station

5+ minute idles
Idle events: 18 (6% ID*, 14% ASID*)
Idle hours: 4.1 (9% ID, 20% ASID)
Fuel used: 4.9 gal (8% ID, 20% ASID)

15+ minute idles
Idle events: 4 (11% ID, 29% ASID)
Idle hours: 2.1 (15% ID, 36% ASID)
Fuel used: 2.8 gal (14% ID, 39% ASID)

30+ minute idles
Idle events: 2 (33% ID, 67% ASID)
Idle hours: 1.5 (37% ID, 65% ASID)
Fuel used: 2.2 gal (34% ID, 73% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota
**Waseca Truck Station**

**5+ minute idles**
- Idle events: 198 (10% ID*, 25% ASID*)
- Idle hours: 29.8 (7% ID, 17% ASID)
- Fuel used: 32.3 gal (6% ID, 15% ASID)

**15+ minute idles**
- Idle events: 24 (6% ID, 14% ASID)
- Idle hours: 8.3 (4% ID, 8% ASID)
- Fuel used: 9.3 gal (3% ID, 8% ASID)

**30+ minute idles**
- Idle events: 2 (1% ID, 3% ASID)
- Idle hours: 1.1 (1% ID, 2% ASID)
- Fuel used: 0.9 gal (0% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.81
Waseca Truck Station

**5+ minute idles**
- Idle events: 43 (14% ID*, 33% ASID*)
- Idle hours: 5.8 (12% ID, 29% ASID)
- Fuel used: 6 gal (10% ID, 25% ASID)

**15+ minute idles**
- Idle events: 2 (5% ID, 14% ASID)
- Idle hours: 0.8 (5% ID, 13% ASID)
- Fuel used: 0.7 gal (4% ID, 10% ASID)

**30+ minute idles**
- Idle events: 0 (0% ID, 0% ASID)
- Idle hours: 0 (0% ID, 0% ASID)
- Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.82
Wells Truck Station

5+ minute idles
Idle events: 186 (9% ID*, 24% ASID*)
Idle hours: 42.9 (10% ID, 24% ASID)
Fuel used: 45.2 gal (9% ID, 21% ASID)

15+ minute idles
Idle events: 28 (8% ID, 17% ASID)
Idle hours: 23.4 (11% ID, 23% ASID)
Fuel used: 22.4 gal (8% ID, 18% ASID)

30+ minute idles
Idle events: 13 (9% ID, 20% ASID)
Idle hours: 18.5 (13% ID, 28% ASID)
Fuel used: 17 gal (10% ID, 21% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.
Wells Truck Station

**Idle Events on High-Activity Days**

**5+ minute idles**
- Idle events: 27 (9% ID*, 21% ASID*)
- Idle hours: 3.1 (7% ID, 16% ASID)
- Fuel used: 3.5 gal (6% ID, 14% ASID)

**15+ minute idles**
- Idle events: 0 (0% ID, 0% ASID)
- Idle hours: 0 (0% ID, 0% ASID)
- Fuel used: 0 gal (0% ID, 0% ASID)

**30+ minute idles**
- Idle events: 0 (0% ID, 0% ASID)
- Idle hours: 0 (0% ID, 0% ASID)
- Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.84
Windom Truck Station

5+ minute idles
Idle events: 121 (6% ID*, 15% ASID*)
Idle hours: 20.1 (5% ID, 11% ASID)
Fuel used: 34.1 gal (7% ID, 16% ASID)

15+ minute idles
Idle events: 17 (5% ID, 10% ASID)
Idle hours: 6.9 (3% ID, 7% ASID)
Fuel used: 12.6 gal (5% ID, 10% ASID)

30+ minute idles
Idle events: 3 (2% ID, 5% ASID)
Idle hours: 2.7 (2% ID, 4% ASID)
Fuel used: 5.7 gal (3% ID, 7% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.85
Windom Truck Station

5+ minute idles
Idle events: 25 (8% ID*, 19% ASID*)
Idle hours: 3.6 (8% ID, 18% ASID)
Fuel used: 6.2 gal (11% ID, 25% ASID)

15+ minute idles
Idle events: 2 (5% ID, 14% ASID)
Idle hours: 0.6 (4% ID, 11% ASID)
Fuel used: 0.9 gal (4% ID, 12% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.86
Worthington Truck Station

5+ minute idles
Idle events: 150 (8% ID*, 19% ASID*)
Idle hours: 45.9 (11% ID, 26% ASID)
Fuel used: 57.9 gal (12% ID, 27% ASID)

15+ minute idles
Idle events: 53 (14% ID, 32% ASID)
Idle hours: 34 (15% ID, 34% ASID)
Fuel used: 45 gal (16% ID, 37% ASID)

30+ minute idles
Idle events: 26 (18% ID, 41% ASID)
Idle hours: 25 (17% ID, 38% ASID)
Fuel used: 33.8 gal (19% ID, 42% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.87
Worthington Truck Station

**Idle Events on High-Activity Days**

5+ minute idles
- Idle events: 16 (5% ID*, 12% ASID*)
- Idle hours: 3.5 (7% ID, 17% ASID)
- Fuel used: 3.8 gal (6% ID, 16% ASID)

15+ minute idles
- Idle events: 6 (16% ID, 43% ASID)
- Idle hours: 2.4 (17% ID, 41% ASID)
- Fuel used: 2.8 gal (14% ID, 39% ASID)

30+ minute idles
- Idle events: 1 (17% ID, 33% ASID)
- Idle hours: 0.8 (20% ID, 35% ASID)
- Fuel used: 0.8 gal (13% ID, 27% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.88
Clara City Truck Station

5+ minute idles
Idle events: 63 (2% ID*, 4% ASID*)
Idle hours: 17.7 (3% ID, 5% ASID)
Fuel used: 14.5 gal (2% ID, 4% ASID)

15+ minute idles
Idle events: 25 (4% ID, 8% ASID)
Idle hours: 12.2 (3% ID, 6% ASID)
Fuel used: 10.6 gal (2% ID, 5% ASID)

30+ minute idles
Idle events: 6 (2% ID, 4% ASID)
Idle hours: 5.5 (2% ID, 4% ASID)
Fuel used: 4.3 gal (1% ID, 3% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota
Clara City Truck Station

5+ minute idles
Idle events: 8 (2% ID*, 3% ASID*)
Idle hours: 1.8 (2% ID, 4% ASID)
Fuel used: 1.8 gal (2% ID, 3% ASID)

15+ minute idles
Idle events: 4 (5% ID, 9% ASID)
Idle hours: 1.2 (2% ID, 5% ASID)
Fuel used: 1.3 gal (2% ID, 4% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.90
5+ minute idles
Idle events: 1351 (49% ID*, 80% ASID*)
Idle hours: 295.7 (43% ID, 81% ASID)
Fuel used: 285.6 gal (42% ID, 80% ASID)

15+ minute idles
Idle events: 255 (41% ID, 77% ASID)
Idle hours: 159.7 (38% ID, 81% ASID)
Fuel used: 165.6 gal (38% ID, 81% ASID)

30+ minute idles
Idle events: 109 (41% ID, 80% ASID)
Idle hours: 109.2 (37% ID, 85% ASID)
Fuel used: 113.6 gal (37% ID, 85% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.
District HQ, Willmar

**5+ minute idles**
- Idle events: 206 (49% ID*, 79% ASID*)
- Idle hours: 38.9 (41% ID, 79% ASID)
- Fuel used: 44 gal (45% ID, 81% ASID)

**15+ minute idles**
- Idle events: 32 (40% ID, 70% ASID)
- Idle hours: 17.9 (35% ID, 77% ASID)
- Fuel used: 25.6 gal (43% ID, 82% ASID)

**30+ minute idles**
- Idle events: 13 (43% ID, 87% ASID)
- Idle hours: 11.3 (32% ID, 88% ASID)
- Fuel used: 17.5 gal (43% ID, 92% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.92
Hutchinson Truck Station

5+ minute idles
Idle events: 204 (7% ID*, 12% ASID*)
Idle hours: 38.1 (6% ID, 10% ASID)
Fuel used: 41.1 gal (6% ID, 12% ASID)

15+ minute idles
Idle events: 33 (5% ID, 10% ASID)
Idle hours: 15.7 (4% ID, 8% ASID)
Fuel used: 17.1 gal (4% ID, 8% ASID)

30+ minute idles
Idle events: 14 (5% ID, 10% ASID)
Idle hours: 9.7 (3% ID, 8% ASID)
Fuel used: 10.6 gal (3% ID, 8% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.93
Hutchinson Truck Station

**5+ minute idles**
- Idle events: 46 (11% ID*, 18% ASID*)
- Idle hours: 8.6 (9% ID, 17% ASID)
- Fuel used: 8.7 gal (9% ID, 16% ASID)

**15+ minute idles**
- Idle events: 10 (13% ID, 22% ASID)
- Idle hours: 4 (8% ID, 17% ASID)
- Fuel used: 4.2 gal (7% ID, 13% ASID)

**30+ minute idles**
- Idle events: 2 (7% ID, 13% ASID)
- Idle hours: 1.5 (4% ID, 12% ASID)
- Fuel used: 1.5 gal (4% ID, 8% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.94
Anoka Truck Station

5+ minute idles
Idle events: 106 (2% ID*, 5% ASID*)
Idle hours: 28.6 (2% ID, 6% ASID)
Fuel used: 29 gal (3% ID, 6% ASID)

15+ minute idles
Idle events: 20 (2% ID, 4% ASID)
Idle hours: 17 (2% ID, 6% ASID)
Fuel used: 17.9 gal (3% ID, 6% ASID)

30+ minute idles
Idle events: 10 (2% ID, 5% ASID)
Idle hours: 13.7 (3% ID, 7% ASID)
Fuel used: 13.7 gal (3% ID, 7% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.95
Anoka Truck Station

**5+ minute idles**
- Idle events: 30 (3% ID*, 6% ASID*)
- Idle hours: 9.3 (5% ID, 9% ASID)
- Fuel used: 9.1 gal (5% ID, 9% ASID)

**15+ minute idles**
- Idle events: 6 (3% ID, 8% ASID)
- Idle hours: 5.9 (6% ID, 12% ASID)
- Fuel used: 5.9 gal (6% ID, 13% ASID)

**30+ minute idles**
- Idle events: 5 (7% ID, 15% ASID)
- Idle hours: 5.5 (8% ID, 15% ASID)
- Fuel used: 5.7 gal (10% ID, 19% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.96
Forest Lake Truck Station

5+ minute idles
Idle events: 178 (4% ID*, 8% ASID*)
Idle hours: 50.9 (4% ID, 10% ASID)
Fuel used: 53 gal (5% ID, 11% ASID)

15+ minute idles
Idle events: 44 (4% ID, 9% ASID)
Idle hours: 33.3 (5% ID, 11% ASID)
Fuel used: 35.6 gal (5% ID, 13% ASID)

30+ minute idles
Idle events: 21 (4% ID, 10% ASID)
Idle hours: 25.4 (5% ID, 13% ASID)
Fuel used: 26.8 gal (6% ID, 14% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.97
Forest Lake Truck Station

5+ minute idles
Idle events: 86 (9% ID*, 18% ASID*)
Idle hours: 25 (12% ID, 24% ASID)
Fuel used: 22.1 gal (12% ID, 23% ASID)

15+ minute idles
Idle events: 19 (11% ID, 25% ASID)
Idle hours: 15.9 (16% ID, 31% ASID)
Fuel used: 14.1 gal (15% ID, 31% ASID)

30+ minute idles
Idle events: 15 (22% ID, 45% ASID)
Idle hours: 14.6 (22% ID, 41% ASID)
Fuel used: 12.8 gal (22% ID, 43% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.98
Lakeville Truck Station

**5+ minute idles**
Idle events: 318 (6% ID*, 15% ASID*)
Idle hours: 89.8 (7% ID, 17% ASID)
Fuel used: 85.5 gal (8% ID, 17% ASID)

**15+ minute idles**
Idle events: 70 (6% ID, 15% ASID)
Idle hours: 57.1 (8% ID, 20% ASID)
Fuel used: 52.8 gal (8% ID, 19% ASID)

**30+ minute idles**
Idle events: 42 (9% ID, 21% ASID)
Idle hours: 47.4 (10% ID, 24% ASID)
Fuel used: 42.7 gal (9% ID, 22% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.99
Lakeville Truck Station

5+ minute idles
Idle events: 68 (7% ID*, 14% ASID*)
Idle hours: 22.7 (11% ID, 22% ASID)
Fuel used: 18.4 gal (10% ID, 19% ASID)

15+ minute idles
Idle events: 16 (9% ID, 21% ASID)
Idle hours: 16.2 (16% ID, 32% ASID)
Fuel used: 12.4 gal (13% ID, 27% ASID)

30+ minute idles
Idle events: 12 (17% ID, 36% ASID)
Idle hours: 14.8 (23% ID, 42% ASID)
Fuel used: 11 gal (18% ID, 37% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Appendix C.100

Imagery: MnGeo Composite Image Service for Minnesota
Maple Grove Truck Station

5+ minute idles
Idle events: 8 (0% ID*, 0% ASID*)
Idle hours: 3.2 (0% ID, 1% ASID)
Fuel used: 3.6 gal (0% ID, 1% ASID)

15+ minute idles
Idle events: 5 (0% ID, 1% ASID)
Idle hours: 2.7 (0% ID, 1% ASID)
Fuel used: 3.2 gal (0% ID, 1% ASID)

30+ minute idles
Idle events: 2 (0% ID, 1% ASID)
Idle hours: 1.5 (0% ID, 1% ASID)
Fuel used: 1.7 gal (0% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.101
Maple Grove Truck Station

5+ minute idles
- Idle events: 3 (0% ID*, 1% ASID*)
- Idle hours: 0.9 (0% ID, 1% ASID)
- Fuel used: 1.1 gal (1% ID, 1% ASID)

15+ minute idles
- Idle events: 2 (1% ID, 3% ASID)
- Idle hours: 0.8 (1% ID, 2% ASID)
- Fuel used: 0.9 gal (1% ID, 2% ASID)

30+ minute idles
- Idle events: 0 (0% ID, 0% ASID)
- Idle hours: 0 (0% ID, 0% ASID)
- Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.
Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

5+ minute idles
Idle events: 546 (11% ID*, 25% ASID*)
Idle hours: 138.4 (11% ID, 27% ASID)
Fuel used: 145.2 gal (13% ID, 29% ASID)

15+ minute idles
Idle events: 152 (12% ID, 32% ASID)
Idle hours: 87.6 (12% ID, 30% ASID)
Fuel used: 97.5 gal (14% ID, 34% ASID)

30+ minute idles
Idle events: 62 (13% ID, 31% ASID)
Idle hours: 56.3 (12% ID, 28% ASID)
Fuel used: 63.9 gal (14% ID, 33% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.
Oakdale Truck Station

5+ minute idles
Idle events: 73 (8% ID*, 15% ASID*)
Idle hours: 12 (6% ID, 12% ASID)
Fuel used: 12.9 gal (7% ID, 13% ASID)

15+ minute idles
Idle events: 10 (6% ID, 13% ASID)
Idle hours: 3.5 (3% ID, 7% ASID)
Fuel used: 4.8 gal (5% ID, 11% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.104
Richfield Truck Station

5+ minute idles
Idle events: 489 (10% ID*, 22% ASID*)
Idle hours: 116.2 (9% ID, 22% ASID)
Fuel used: 92 gal (8% ID, 19% ASID)

15+ minute idles
Idle events: 117 (10% ID, 25% ASID)
Idle hours: 64.3 (9% ID, 22% ASID)
Fuel used: 51.6 gal (8% ID, 18% ASID)

30+ minute idles
Idle events: 48 (10% ID, 24% ASID)
Idle hours: 40 (8% ID, 20% ASID)
Fuel used: 32.4 gal (7% ID, 17% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota
Richfield Truck Station

5+ minute idles
Idle events: 49 (5% ID*, 10% ASID*)
Idle hours: 8.7 (4% ID, 8% ASID)
Fuel used: 6.7 gal (4% ID, 7% ASID)

15+ minute idles
Idle events: 9 (5% ID, 12% ASID)
Idle hours: 3.6 (4% ID, 7% ASID)
Fuel used: 2.9 gal (3% ID, 6% ASID)

30+ minute idles
Idle events: 1 (1% ID, 3% ASID)
Idle hours: 0.6 (1% ID, 2% ASID)
Fuel used: 0.5 gal (1% ID, 2% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Appendix C.106

Imagery: MnGeo Composite Image Service for Minnesota
Saint Paul Truck Station

5+ minute idles
Idle events: 384 (8% ID*, 18% ASID*)
Idle hours: 58 (5% ID, 11% ASID)
Fuel used: 62 gal (5% ID, 13% ASID)

15+ minute idles
Idle events: 35 (3% ID, 7% ASID)
Idle hours: 13.7 (2% ID, 5% ASID)
Fuel used: 13.8 gal (2% ID, 5% ASID)

30+ minute idles
Idle events: 6 (1% ID, 3% ASID)
Idle hours: 4.1 (1% ID, 2% ASID)
Fuel used: 4.5 gal (1% ID, 2% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.107
Saint Paul Truck Station

5+ minute idles
Idle events: 161 (17% ID*, 33% ASID*)
Idle hours: 22.8 (11% ID, 22% ASID)
Fuel used: 23.7 gal (13% ID, 25% ASID)

15+ minute idles
Idle events: 12 (7% ID, 16% ASID)
Idle hours: 4.1 (4% ID, 8% ASID)
Fuel used: 3.6 gal (4% ID, 8% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.
Spring Lake Park Truck Station

5+ minute idles
Idle events: 120 (2% ID*, 5% ASID*)
Idle hours: 22.3 (2% ID, 4% ASID)
Fuel used: 15.4 gal (1% ID, 3% ASID)

15+ minute idles
Idle events: 19 (2% ID, 4% ASID)
Idle hours: 9.3 (1% ID, 3% ASID)
Fuel used: 5.9 gal (1% ID, 2% ASID)

30+ minute idles
Idle events: 5 (1% ID, 2% ASID)
Idle hours: 4.4 (1% ID, 2% ASID)
Fuel used: 2.6 gal (1% ID, 1% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

Idle events from November 1, 2018 thru April 30, 2019 and November 1, 2019 thru April 17, 2020.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.109
Spring Lake Park Truck Station

5+ minute idles
Idle events: 19 (2% ID*, 4% ASID*)
Idle hours: 2.9 (1% ID, 3% ASID)
Fuel used: 2.1 gal (1% ID, 2% ASID)

15+ minute idles
Idle events: 2 (1% ID, 3% ASID)
Idle hours: 0.8 (1% ID, 2% ASID)
Fuel used: 0.6 gal (1% ID, 1% ASID)

30+ minute idles
Idle events: 0 (0% ID, 0% ASID)
Idle hours: 0 (0% ID, 0% ASID)
Fuel used: 0 gal (0% ID, 0% ASID)

* Percent of in-district (ID) figures are based on all idle events for vehicles matched to the district and are not limited to idle events occurring at truck stations. Percent of at-station, in-district (ASID) excludes idle events not at truck stations.

High-activity days are defined, per district, in this appendix.

Imagery: MnGeo Composite Image Service for Minnesota

Appendix C.110