



Electronic Red Light Safety Program 2015 Detailed Site Selection Process July 14, 2016

The process of selecting additional red-light enforcement camera locations to supplement the existing 51 monitored approaches at 30 intersections began in early 2015 and included an initial screening, a final ranking, and approach selection. This report describes the steps in the process and details the decisions made by DelDOT throughout the process.

DelDOT's Electronic Red Light Safety Program (ERLSP) uses red-light-running crash data to identify candidate intersections and monitor safety benefits to the traveling public at existing camera locations. This methodology allows the program to be safety data-driven, rather than revenue- or public request-driven. Annual reports continue to show a significant reduction in angle crashes at the existing ERLSP camera sites.

Initial Screening

For the 2015 site selection, statewide crash data for calendar year 2010 through 2014 was obtained from Delaware's Crash Analysis Reporting System (CARS). To select the crashes that were most likely to be red-light-running, the crash data was reduced to those crashes coded as "Primary Contributing Circumstance: Disregard Traffic Signal" or "Driver Action: Ran Red Light." This resulted in a list of 3,755 statewide crashes that then had location data cross-referenced to DelDOT's signal permit number database. For the initial screening, no crash information was reviewed, so inaccuracies in reported location and crash variables may cause initial crash totals to be imprecise. Of the 3,755 statewide crashes, 2,629 were matched with a DelDOT signal permit number, 715 occurred in the City of Wilmington (at a location that did not also have a DelDOT signal permit number) and were subsequently removed from further analysis, and 411 were not located near a signal and/or the location was unclear. The initial list of DelDOT signal permit numbers with total number of cross-referenced crashes is provided in **Appendix A**.

The initial list was then sorted by total crashes, and a preliminary ranking of 184 intersections with five or more cross-referenced crashes was created. Of these intersections, 8 were signals within the City of Wilmington and 20 were existing ERLSP camera locations. These 28 signals were removed from the analysis at this stage. **Appendix B** includes the preliminary ranking of intersections with five or more crashes. Additional site characteristics (constraints and history of improvements) of the remaining signals were not reviewed at this stage, in favor of reviewing all crash data prior to making decisions about an intersection's candidacy.

Final Ranking

Once the preliminary ranking list was established, full crash data analysis was performed on each candidate intersection beginning with the highest rank. At-fault movement was noted, when determined in the crash narrative, for each red-light-running crash. The analysis included:

- Reviewing each of the crashes from the initial data set to confirm location and crash type and identifying the at-fault movement
- Obtaining additional crash data from CARS of all crashes occurring at each candidate intersection over the five-year analysis period to identify any red-light-running crashes that were missed in the original data set
 - For this set of crash data, narratives for all reported crashes with "Manner of Impact: Angle, Front-to-front, or Sideswipe Opposite Direction" were read and reviewed for red light running

- Reading narratives of the 411 crashes in the original data set that did not appear to be referenced to a signalized intersection to identify any that were red-light-running crashes

To minimize unnecessary time spent on crash data review, a decision was made to only perform full crash data reviews at intersections with 8 or more cross-referenced crashes. This included intersections through preliminary rank 80 and resulted in 61 fully-analyzed intersections.

Because cameras are installed on an intersection approach, the at-fault information obtained through the crash data review was summarized by approach. A final ranking of candidate sites was created by ranking the sites by most red-light-running crashes by at-fault approach, with "ties" sub-ranked by total red-light-running crashes. There were 53 sites with four or more crashes on the highest at-fault approach and seven or more total intersection crashes. This ranked list is presented in **Appendix C**. A timeline of crashes was also provided to facilitate candidacy discussion.

Similarly, to evaluate the crash characteristics and monitored approaches of the existing ERLSP camera sites, five-year crash data was reviewed and ranked by highest at-fault approach. This list is included in **Appendix D**. This step was not taken in previous site selection processes; however, DeIDOT wished to analyze existing sites for potential additional approach monitoring.

Site Selection Meeting – August 27, 2015

WRA met with DeIDOT staff to present the final rankings of candidate intersections, discuss the site selection process, and determine a list of candidate intersections to provide Xerox, DeIDOT's red-light camera contractor, to begin video validation. Minutes of this meeting are included as **Appendix E**. The following is a list of sites eliminated as candidate intersections at this stage for reasons described below:

- Rank 3 – Milltown Road at McKennans Church Road
 - Currently scheduled to be rebuilt relatively soon, which should address some of the sign clutter and driver confusion issues
 - Poor candidate location due to the proximity of the SR 7 at Milltown Road intersection
- Rank 10 – SR 141 (Powder Mill Road) at Childrens Drive / Powder Mill Road
 - Significant horizontal curve on the "eastbound" SR 141 approach, which had the highest number of at-fault crashes
 - The first view of either through signal head occurs at 445 feet from the stop line, and unobstructed view of both through signal heads occurs at 350 feet from the stop line. DE MUTCD Table 4D-2 specifies a minimum sight distance of 460 feet for an approach speed of 45 MPH.
 - Based on these measurements, a RED SIGNAL AHEAD WHEN FLASHING warning sign is currently in design to provide an active engineering countermeasure
- Rank 12 – US 113 at SR 18 / SR 404 (Bridgeville Road / Seashore Highway)
 - High number of left-turn at-fault crashes and the large size of the intersection may be indicative of insufficient change and clearance intervals
 - Northbound and southbound left turns receive 3-second yellow change and 2-second all-red clearance intervals
 - A timesheet calculation package was completed to implement increased yellow and red intervals as an engineering countermeasure
- Rank 13 – US 40 at SR 7 (Bear Corbitt Road / Bear Christiana Road)
 - Similar to Rank 12, the high number of left-turn at-fault crashes and the large size of the intersection may be indicative of insufficient change and clearance intervals
 - A review of 2015 crashes from January 2015 to August 2015 showed three additional red-light-running crashes had occurred during this period

- A timesheet calculation package was completed to implement increased yellow and red intervals as an engineering countermeasure
- Rank 14 – SR 1 at SR 16 (Broadkill Road)
 - Flashing beacons were installed in January 2007 to supplement the northbound and southbound Signal Ahead warning signs
 - The signal has recently been rebuilt and lighting has been added
 - A DelDOT project is currently planned to grade-separate this intersection by 2021
 - Per DelDOT request, crash reports at the intersection were reviewed from January 2015 to August 2015 – one additional red-light-running crash occurred during this period
- Rank 15 – US 301 / SR 896 (Summit Bridge Road) at Howell School Road
 - This intersection will be realigned (presently under construction)
- Rank 17 – US 40 at Glasgow Avenue
 - Due to the separation of the eastbound and westbound intersections, separating the eight southbound Glasgow Avenue through at-fault crashes into two occurring at US 40 eastbound and six occurring at US 40 westbound, it was recommended that this site be considered as two separate intersections with a maximum at-fault approach of six crashes, resulting in a lower rank and recommended elimination as a candidate location
- Rank 18 – US 13 at Martin Luther King Jr Boulevard
 - There is a significant horizontal curve on the southbound US 13 approach, which had the highest number of at-fault crashes
 - An ongoing HEP project will provide a supplemental signal head for southbound traffic as an engineering countermeasure
 - This intersection has also been eliminated from consideration during previous site selection studies due to the horizontal curvature
- Rank 19 – SR 4 WB (Justis St) at James St
 - This intersection was eliminated in previous site selection studies due to insufficient sight distance on the southbound approach, which had the highest number of at-fault crashes
 - There is also a signal rebuild project in design
- Rank 24 – US 113 at SR 24 (Laurel Road / Washington Street)
 - Significant horizontal curve on the southbound US 113 approach, which had the highest number of at-fault crashes and a skew to the westbound SR 24 approach, which also had a relatively high crash total
 - A signal rebuild is currently under construction and backplates will be added
- Rank 27 – SR 4 at Stanton Road
 - Intersection was just rebuilt with a supplemental westbound signal head

Rank 27 represented the last candidate site with seven or more crashes by at-fault approach. Expanding the ERLSP monitoring by up to the 16 selected intersections was considered sufficient for the 2015 site selection process. Thus, sites ranked lower than 27 were not considered for the program at this time.

Potential additional monitoring at the existing 30 DelDOT red light camera sites was also discussed. WRA provided a similar ranked list of crashes at the intersections over a five-year period organized by at-fault approach. The top six sites had 7 or more red-light-running crashes on an approach that is not currently being monitored, which was the same threshold used on the candidate list for new intersection monitoring.

- Rank 6 – North Street at Governors Avenue had seven crashes on the unmonitored northbound approach; however, it was agreed that geometric concerns would prevent camera pole installation on the northbound approach
- Rank 28 – SR 2 at SR 100 (Dupont Road) had only one at-fault crash on each approach, but per a request from the Town of Elsmere, DelDOT agreed to recommend video validation of the three unmonitored approaches

All approaches at the 16 selected candidate intersections and selected additional approaches at 6 existing camera locations were submitted to Xerox for video validation – 16 hours (6 AM – 10 PM) of video monitoring of an approach to observe how many red-light-running violations are occurring at each location. The list of intersections and approaches submitted to Xerox are included in **Appendix F**.

Approach Selection

Xerox performed video validation throughout October and November 2015 to provide red-light-running violation data by approach and movement (left and through). Additionally, WRA performed site visits at all of the candidate locations to assess camera constructability and obtain signal timesheet calculation data to update all yellow and red intervals to DelDOT's updated standard. Summarized violation data, including a summary of crashes by at-fault approach, is provided in **Appendix G**. This document guided discussions of the monitored approach selection at a second meeting with DelDOT staff.

Monitored Approach Selection Meeting – January 20, 2016

Based on violation data obtained by Xerox and field data obtained by WRA, DelDOT selected which approaches to monitor at the 16 candidate intersections and which additional approaches to monitor at the 6 existing ERLSP sites. Minutes of this meeting are included as **Appendix H**. Only two approaches were eliminated due to camera constructability issues – westbound Kenmar Drive at SR 72 due to a sharp approach curve and the eastbound driveway at Summit Village Shopping Center at US 301/SR 896. Additionally, all candidate sites had yellow and red intervals reviewed and timesheet packages were submitted to DelDOT for implementation. The most significant yellow change interval adjustments to candidate sites were 2.0-second increases to left turns and 1.0-second increases to through movements. Below is a discussion of each candidate site. The highest at-fault red-light-running crash approach direction is presented in parentheses; DelDOT's ERLSP program guidelines stipulate that to monitor an intersection, the highest at-fault red-light-running crash approach shall be monitored.

- Rank 1 – US 13 at Memorial Drive / Hazeldell Avenue (NB)
 - The group agreed to monitor the northbound and southbound approaches
 - The eastbound and westbound approaches were not selected for monitoring due to low crash and violation totals and significantly lower volumes than US 13
- Rank 2 – US 40 at Glasgow Drive (WB)
 - The group agreed to monitor the westbound and eastbound approaches
 - The southbound approach was not selected for monitoring due to low crash and violation totals and serving primarily as a driveway for a shopping center and small neighborhood
- Rank 4 – SR 72 (S. Chapel Street) at Kenmar Drive / Pencader Plaza (SB)
 - The group agreed to monitor the southbound and northbound approaches
 - The westbound approach is unable to be monitored due to constructability concerns and the eastbound approach was not selected for monitoring due to no crash history and no precedent for monitoring shopping center accesses
- Rank 5 – US 13 at Boulden Boulevard / Bacon Avenue (SB)
 - The group agreed to monitor all four approaches

- Rank 6 – SR 273 (Christiana Road) at SR 1 SB ramps (EB)
 - The group agreed to monitor the eastbound approach
 - The southbound approach was not selected for monitoring due to no crash history and violations typically occurring during the PM peak period, when traffic is known to be extremely heavy
 - The westbound approach was not selected for monitoring due to low crash and violation totals and concerns with approach sight distance from the SR 1 underpass
- Rank 7 – US 40 at Eden Square (EB)
 - The group agreed to monitor the eastbound and westbound approaches
 - The northbound approach was not selected for monitoring due to very low crash and violation totals and no precedent for monitoring shopping center accesses
- Rank 8 – SR 58 (Churchmans Road) at I-95 / SR 1 SB / SR 7 SB ramps (EB)
 - The group agreed to monitor all three approaches
- Rank 9 – SR 4 at Salem Church Road / SR 273 Connector (EB)
 - The group agreed to monitor all four approaches
- Rank 11 – SR 58 (Churchmans Road) at I-95 SB off-ramp (WB)
 - The group agreed to monitor the westbound and eastbound approaches
 - The southbound approach was not selected for monitoring due to low crash and violation totals and the abrupt horizontal curvature near the stop line
- Rank 16 – US 202 at Silverside Road (NB)
 - The group agreed to monitor the northbound and southbound approaches
 - The westbound approach was not selected for monitoring due to no crash history, low violation totals, and potential motorist confusion with enforcing the crossing of the northbound US 202 lanes but not the southbound US 202 signalized merge
- Rank 20 – US 301 / SR 896 (Summit Bridge Road) at Summit Village Shopping Centre / Shoppes of Mt. Pleasant (SB)
 - The group agreed to monitor the southbound and northbound approaches
 - The eastbound approach is unable to be monitored due to constructability concerns and the westbound approach was not selected for monitoring due to no crash history and no precedent for monitoring shopping center accesses
- Rank 21 – SR 1 at US 9 (SB and EB)
 - The group agreed to monitor all four approaches
- Rank 22 – SR 141 (Centre Road) at SR 34 (Faulkland Road) (NB)
 - The group agreed to monitor all four approaches
- Rank 23 – SR 141 (Powder Mill Road) at W. Park Drive / US 202 SB off-ramp (EB)
 - The group agreed to monitor the eastbound, westbound and southbound approaches
 - The northbound approach was not selected for monitoring due to the primary movement being a signalized right turn, which DelDOT does not enforce as part of its ERLSP
- Rank 25 – SR 4 at SR 72 (S. Chapel Street) (SB)
 - The group agreed to monitor all four approaches
- Rank 26 – US 40 at Governors Square (WB)
 - The group agreed to monitor the eastbound and westbound approaches



- The northbound and southbound approaches were not selected for monitoring due to no crash history and no precedent for monitoring shopping center accesses

Additionally, monitoring at six of the existing 30 DelDOT red light camera sites that met similar at-fault crash total thresholds as the candidate sites was discussed.

- Rank 1 – US 40 at Scotland Drive
 - The group agreed to add monitoring to the westbound approach (eastbound currently monitored)
- Rank 2 – SR 58 (Churchmans Road) at SR 7 NB ramps / Geoffrey Drive
 - The group agreed to add monitoring to the eastbound approach (westbound currently monitored)
- Rank 3 – US 40 at SR 896
 - The group agreed to add monitoring to the remaining three approaches (westbound currently monitored)
- Rank 4 – US 13 at Roosevelt Avenue (NCC)
 - The group agreed to add monitoring to the southbound approach (northbound currently monitored)
- Rank 5 – US 113 at SR 20 (Hardscrabble Road) / Betts Pond Road
 - The group agreed to add monitoring to the northbound approach (southbound currently monitored)
- Rank 28 – SR 2 at SR 100 (Dupont Road)
 - At the August meeting, the group agreed to perform a video validation at this intersection in order to confirm whether additional approaches should be monitored. No significant violation trends were observed
 - The group agreed not to add additional monitoring (eastbound currently monitored)

A final summary document was prepared summarizing proposed monitoring locations, approach directions to be monitored, and area legislative representation. This summary is shown in **Appendix I**. In accordance with DelDOT's ERLSP Intersection Selection Process, presented in **Appendix J**, prior to the installation of cameras at new intersections, the incumbent state senator and representative for the districts in which such locations are proposed were notified.

Public Notification

Once the list of recommended monitored approaches was finalized, DelDOT requested concurrence from the Office of Highway Safety and Delaware State Police (DSP), which were received in April and May 2016, respectively. Additionally, DelDOT individually notified each of the corresponding state legislators with new red-light enforcement camera(s) in his or her district. Prior to publishing its annual report, DelDOT reviewed the draft report and the ERLSP site selection process with AAA Mid-Atlantic. DelDOT released its calendar year 2015 ERLSP report on April 22, 2016, which contained the complete list of ERLSP expansion intersections, and DelDOT subsequently discussed the findings of the report and the ERLSP expansion with the Joint Committee on Capital Improvement (i.e., Bond Bill Committee) on April 25, 2016. Lastly, DelDOT met with its ERLSP municipal partners and DSP in May 2016 as part of its quarterly review of the ERLSP and to highlight the upcoming program expansion.

APPENDIX

A

INITIAL Red Light Running Crashes by DeIDOT Signal Permit Number

NEW CASTLE COUNTY

Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash
N001P	0	N071P	0	N139	0	N199	0	N259	1	N319	1	N379	0
N002P	2	N072P	0	N140	5	N200	2	N260	4	N320	0	N380	0
N003P	1	N073P	0	N141	7	N201	0	N261	4	N321	0	N381	6
N004P	1	N074P	1	N142	0	N202	1	N262	1	N322	2	N382	3
N005P	1	N080T	0	N143	7	N203	1	N263	0	N323	8	N383	0
N006P	10	N082P	0	N144	6	N204	0	N264	3	N324	5	N384	1
N007P	0	N083P	0	N145	3	N205	1	N265	0	N325	7	N385	4
N008P	3	N084P	0	N146	7	N206	1	N266	1	N326	8	N386	0
N009P	0	N085P	5	N147	3	N207	0	N267	0	N327	3	N387	2
N010P	1	N086P	0	N148	0	N208	0	N268	3	N328	1	N388	3
N011P	0	N087P	1	N149	0	N209	2	N269	3	N329	1	N389	1
N012P	0	N088P	2	N150	9	N210	0	N270	2	N330	3	N390	2
N013P	1	N089P	1	N151	0	N211	1	N271	9	N331	1	N391	0
N014P	3	N090P	4	N152	3	N212	4	N272	5	N332	18	N392	2
N015P	0	N091P	0	N153	6	N213	6	N273	2	N333	2	N393	6
N016P	2	N092P	0	N154	1	N214	0	N274	0	N334	1	N394	0
N017P	2	N093P	0	N155	1	N215	4	N275	1	N335	1	N395	10
N018P	0	N094P	2	N156	7	N216	3	N276	1	N336	1	N396	2
N019P	3	N095P	0	N157	4	N217	21	N277	1	N337	4	N397	10
N020P	2	N097P	0	N158	0	N218	12	N278	2	N338	2	N398	7
N021P	2	N098P	2	N159	6	N219	2	N279	0	N339	9	N399	0
N022P	0	N100	0	N160	3	N220	3	N280	0	N340	0	N400	3
N023P	1	N101	8	N161	0	N221	0	N281	4	N341	1	N401	0
N025P	0	N102	15	N162	9	N222	0	N282	4	N342	2	N402	0
N026P	1	N103	1	N163	14	N223	2	N283	1	N343	2	N403	0
N027P	0	N104	9	N164	1	N224	0	N284	1	N344	0	N404	0
N028P	7	N105	4	N165	14	N225	5	N285	5	N345	0	N405	15
N029P	0	N106	0	N166	6	N226	0	N286	8	N346	12	N406	7
N030P	5	N107	3	N167	8	N227	0	N287	1	N347	2	N407	4
N031P	0	N108	3	N168	6	N228	0	N288	19	N348	4	N408	3
N032P	0	N109	7	N169	0	N229	0	N289	4	N349	3	N409	6
N033P	0	N110	0	N170	2	N230	1	N290	7	N350	1	N410	0
N034P	0	N111	1	N171	3	N231	3	N291	1	N351	2	N411T	3
N035P	11	N112	1	N172	7	N232	2	N292	2	N352	3	N412	0
N036P	5	N113	0	N173	9	N233	7	N293	5	N353	1	N413T	1
N037P	0	N114	10	N174	1	N234	1	N294	0	N354	0	N414T	8
N038P	2	N115	0	N175	0	N235	1	N295	4	N355	6	N415T	0
N039P	0	N116	1	N176	5	N236	2	N296	3	N356	6	N416T	2
N040P	10	N117	2	N177	5	N237	1	N297	6	N357	4	N417T	0
N041P	2	N118	1	N178	7	N238	2	N298	3	N358	4	N418T	2
N042P	0	N119	1	N179	28	N239	15	N299	1	N359	2	N419T	0
N043P	0	N120	3	N180	2	N240	0	N300	1	N360	0	N420T	0
N044P	0	N121	1	N181	7	N241	2	N301	1	N361	1	N422T	8
N045P	0	N122	2	N182	12	N242	13	N302	0	N362	5	N423T	6
N046P	1	N123	1	N183	10	N243	5	N303	3	N363	4	N424T	2
N047P	0	N124	0	N184	0	N244	3	N304	1	N364	8	N425T	0
N048P	0	N125	1	N185	13	N245	7	N305	8	N365	0	N426T	1
N049P	0	N126	2	N186	4	N246	1	N306	3	N366	5	N427T	1
N050P	0	N127	6	N187	16	N247	2	N307	29	N367	4	N428T	3
N051P	0	N128	0	N188	9	N248	6	N308	3	N368	3	N429T	1
N052P	0	N129	3	N189	0	N249	0	N309	0	N369	6	N430T	1
N053P	0	N130T	0	N190	1	N250	0	N310	1	N370	0	N431T	0
N054P	0	N131	1	N191	17	N251	8	N311	3	N371	6	N432T	3
N055P	0	N132	2	N192	7	N252	1	N312	6	N372	0	N433T	1
N056P	0	N133	1	N193	8	N253	1	N313	7	N373	3	N434T	3
N057P	0	N134	1	N194	0	N254	2	N314	0	N374	3	N435T	6
N058P	0	N135	2	N195	5	N255	5	N315	3	N375	0	N436T	10
N059P	0	N136	3	N196	1	N256	0	N316	1	N376	0	N437	3
N060P	0	N137	0	N197	1	N257	1	N317	10	N377	0	N438T	2
N067P	0	N138	0	N198	2	N258	1	N318	9	N378	2	N439T	2

**INITIAL Red Light Running Crashes by DeIDOT Signal Permit Number
NEW CASTLE COUNTY**

Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash
N440T	0	N500T	2	N560	0	N620T	0	N680	0	N740	0
N441T	0	N501	4	N561	4	N621T	1	N681	0	N741	18
N442T	2	N502	0	N562	0	N622	0	N682	0	N742	0
N443T	0	N503	3	N563T	1	N623	0	N683	1	N743	0
N444T	0	N504	6	N564	2	N624	0	N684T	3	N744	0
N445T	3	N505	3	N565	1	N625	3	N685T	4	N745	0
N446T	4	N506	7	N566	1	N626	1	N686T	7	N766	0
N447T	0	N507	1	N567	0	N627T	46	N687T	0	N767	0
N448T	0	N508	1	N568	0	N628	1	N688T	1	N768	0
N449T	0	N509	0	N569T	0	N629	0	N689T	1	N769	1
N450T	1	N510	0	N570	7	N630	0	N690T	4	N770	0
N451T	1	N511T	3	N571T	0	N631	0	N691T	2	N771	0
N452T	0	N512	0	N572	3	N632	2	N692T	0	N772	1
N453	5	N513	1	N573	1	N633	3	N693T	4	N773	0
N454	4	N514	6	N574	1	N634	0	N694T	0	N774	0
N455	0	N515	3	N575	0	N635	1	N695T	0	N775	0
N456T	1	N516	1	N576	7	N636	4	N696T	1	N776	1
N457T	0	N517	6	N577	2	N637	0	N697T	1	N777	0
N458T	0	N518	0	N578	0	N638	0	N698	1	N778	0
N459T	0	N519	5	N579	14	N639	1	N699	0	N779	0
N460	7	N520	5	N580	0	N640	0	N700	0	N780	0
N461	1	N521	8	N581	4	N641	0	N701	3	N781	0
N462	13	N522	16	N582	0	N642	0	N702	0	N782	0
N463	2	N523	3	N583	2	N643	2	N703T	5	N783	0
N464	2	N524	2	N584	0	N644	0	N704	0	N784	0
N465	0	N525	3	N585	7	N645	1	N705	8	N785	0
N466	2	N526	3	N586	0	N646	1	N706	4	N786	0
N467T	1	N527	1	N587	2	N647	0	N707	1	N787	0
N468	3	N528	2	N588	0	N648	0	N708	1	N788	0
N469	5	N529	8	N589	3	N649	0	N709	0	N789	0
N470	5	N530	3	N590	2	N650	0	N710	2	N790	0
N471	1	N531	11	N591	5	N651	1	N711	0	N791	0
N472	3	N532	5	N592	0	N652	0	N712	0	N792	0
N473	0	N533	0	N593	1	N653P	0	N713	0	N793	0
N474	2	N534	1	N594	3	N654	0	N714T	0	N794	0
N475	5	N535	1	N595	5	N655	0	N715	4	N795	0
N476	4	N536	2	N596	16	N656	2	N716	0	N796	0
N477	4	N537	2	N597	2	N657	0	N717	0	N797	0
N478	0	N538	0	N598	2	N658	0	N718	0	N798	0
N479	1	N539	2	N599	1	N659	4	N719T	0	N799	0
N480	1	N540	2	N600	0	N660	5	N720	0	N800	0
N481	3	N541	5	N601	2	N661	1	N721	3	N801	0
N482	0	N542	1	N602	0	N662	1	N722	0	N802	0
N483	17	N543T	0	N603T	0	N663T	0	N723	0	N803	0
N484	5	N544T	0	N604	2	N664	0	N724	0	N805	0
N485	5	N545	1	N605T	9	N665	0	N725T	0	N806	0
N486	5	N546	2	N606	0	N666	0	N726	1	N807	0
N487	1	N547	3	N607	3	N667	0	N727	1	N808	0
N488T	0	N548	0	N608	1	N668	0	N728	0	N809	0
N489	3	N549	0	N609T	0	N669	1	N729	0	N810	0
N490	4	N550	0	N610T	0	N670T	2	N730	0	N811	0
N491	6	N551	2	N611	3	N671	0	N731	0	N812	0
N492	2	N552	6	N612	1	N672	4	N732	1	N813	0
N493	0	N553	1	N613	2	N673	0	N733	0	N814	0
N494	4	N554	0	N614	1	N674	0	N734	0	N815	0
N495	4	N555	1	N615	0	N675	0	N735	0	N816	0
N496	0	N556	3	N616T	10	N676	16	N736	0	N817	0
N497	0	N557	0	N617T	0	N677	2	N737	0		
N498	0	N558	0	N618T	0	N678	0	N738	0		
N499	3	N559T	0	N619T	4	N679	0	N739	0		

INITIAL Red Light Running Crashes by DeIDOT Signal Permit Number

KENT COUNTY

Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash
K001P	5	K148	4	K209	0	K269T	4
K002P	5	K149	0	K210	0	K270T	2
K003P	0	K150	0	K211	0	K271T	1
K004P	3	K151	3	K212	0	K272	4
K005P	3	K152	4	K213	0	K273	1
K006P	0	K153	2	K214	0	K274T	0
K009P	11	K154	3	K215	0	K275	0
K014P	0	K155	0	K216	0	K276	0
K015P	2	K156	0	K217T	3	K277	0
K016P	0	K157	2	K218	0	K278	5
K017P	0	K158	0	K219	0	K279	0
K018P	6	K159	0	K220	1	K280	0
K019P	5	K160	0	K221	0	K281	0
K101	7	K161	0	K222	0	K282	0
K102	3	K163T	4	K223	0	K283	0
K103	0	K164T	0	K224	0	K284	2
K104	2	K165T	0	K225	0	K285	0
K105	0	K166T	0	K226	0	K286	0
K106	2	K167T	1	K227	4	K287	1
K107	4	K168T	0	K228	1	K288	2
K108	4	K169	4	K229	0	K289	2
K109	1	K170T	1	K230	1	K290	1
K110	2	K171T	1	K231	0	K291	2
K111	0	K172	0	K232	1	K292	0
K112	15	K173T	0	K233T	0	K293	0
K113	8	K174	2	K234	0	K294	1
K114	2	K175T	10	K235	0	K295	0
K115	0	K176T	0	K236	5	K296	0
K116	4	K177T	1	K237	1	K297	0
K117	6	K178	3	K238	0	K298	0
K118	7	K179T	0	K239	8	K299	0
K119	0	K180	4	K240	0	K300	0
K120	0	K181	2	K241	0	K301	4
K121	1	K182	2	K242	1	K302	0
K122	4	K183P	3	K243	0	K303	0
K123	5	K184	0	K244	0	K304	0
K124	3	K185	0	K245	0	K305	0
K125	2	K186	0	K246	2	K306	0
K126	2	K187	0	K247	3	K307	0
K127	1	K188	1	K248	0	K308	0
K128	6	K189	3	K249	8	K309	0
K129	0	K190	0	K250	0	K310	0
K130	0	K191	1	K251	1	K311	0
K131	6	K192	2	K252	4	K312	0
K132	5	K193	1	K253	0	K313	0
K133	6	K194	3	K254	0	K315	0
K134	4	K195	1	K255T	0	K316	0
K135	7	K196P	1	K256T	1		
K136	4	K197T	0	K257T	0		
K137	4	K198	3	K258T	3		
K138	0	K199	8	K259T	3		
K139	0	K200	0	K260T	1		
K140	4	K201	7	K261T	0		
K141	3	K202	4	K262T	9		
K142	1	K203	0	K263T	3		
K143	0	K204	0	K264T	2		
K144	0	K205	0	K265T	11		
K145	2	K206	0	K266T	3		
K146	3	K207	0	K267T	2		
K147	4	K208	0	K268T	3		

**INITIAL Red Light Running Crashes by DeIDOT Signal Permit Number
SUSSEX COUNTY**

Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash	Permit	Crash
S001P	0	S151	4	S213	3	S273	0	S333	0
S002P	0	S152	0	S214	5	S274	0	S334	0
S007P	1	S153	0	S215	0	S275	0	S335	0
S008P	1	S154	0	S216	3	S276	0	S336	0
S013P	0	S155	0	S217	0	S277	0	S337	0
S027P	2	S156	0	S218	0	S278	0	S338	0
S029P	1	S157	0	S219	1	S279	0	S339	1
S031P	0	S158	1	S220	0	S280	0	S340	0
S035P	1	S159	3	S221	0	S281	0	S341	0
S036P	0	S160	9	S222	0	S282	0	S343	0
S037P	0	S161	1	S223	0	S283	3	S344	0
S101	11	S162	8	S224P	1	S284	0	S345	0
S102	1	S163T	0	S225	0	S285	3	S346	0
S103	6	S164T	0	S226	1	S286	0	S347	0
S104	6	S165T	1	S227	0	S287	0	S348	0
S105	2	S166T	0	S228	1	S288	1	S349	0
S106	4	S167T	1	S229	0	S289	0	S350	0
S107	0	S168T	1	S230	0	S290	2		
S108	4	S169	0	S231	0	S291	2		
S109	10	S170T	4	S232	0	S292	0		
S110	13	S171T	2	S233T	0	S293	0		
S111	10	S172T	0	S234	2	S294	0		
S112	9	S173T	0	S235	0	S295	0		
S113	3	S174T	0	S236	7	S296	2		
S114	0	S175T	0	S237P	0	S297	2		
S115	1	S176T	1	S238	3	S298	1		
S116	4	S178T	0	S239	2	S299	2		
S117	0	S179T	0	S240	0	S300	0		
S118	3	S180	3	S241	0	S301	2		
S119	1	S181	0	S242	0	S302P	0		
S120T	1	S182	0	S243	2	S303	1		
S121	16	S183	11	S244	2	S304	0		
S122	0	S184	0	S245	0	S305	0		
S123	0	S185T	0	S246	0	S306	10		
S124	4	S186T	0	S247	3	S307	0		
S125	7	S187T	0	S248	1	S308	0		
S126	3	S188	2	S249	1	S309	0		
S127	5	S189P	5	S250	3	S310	0		
S128	4	S190T	1	S251	0	S311	0		
S129	1	S191T	0	S252	0	S312	1		
S130	0	S192T	1	S253	0	S313	1		
S131	0	S193T	1	S254	0	S314	3		
S132	2	S194T	0	S255	0	S315	4		
S133	5	S195	4	S256	0	S316	0		
S134	2	S196	1	S257	0	S317	0		
S135	1	S197P	0	S258	0	S318	0		
S136	13	S198	0	S259	0	S319	0		
S137	0	S199	2	S260	0	S320	0		
S138	0	S200	4	S261	0	S321	1		
S139	2	S202	0	S262	0	S322	0		
S140	4	S203	4	S263	2	S323	0		
S141	3	S204	4	S264	0	S324	1		
S143P	1	S205P	0	S265	3	S325	0		
S144	7	S206	3	S266	0	S326	0		
S145	0	S207	8	S267	0	S327	0		
S146	0	S208	0	S268	0	S328	0		
S147T	0	S209	5	S269	2	S329	0		
S148	0	S210	1	S270	1	S330	1		
S149	0	S211	2	S271	0	S331	0		
S150	0	S212	1	S272	0	S332	1		

APPENDIX

B



**2015 Electronic Red Light Safety Program
Identification of Candidate Locations
May 6, 2015**

Legend			
Candidate Intersection	To Be Determined	To Be Determined	To Be Determined
Eliminate Intersection	To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined	To Be Determined

Statewide Rank	Permit Number	Major Intersecting Road	Minor Intersecting Road	County or City	Red Light Crashes (*10-14)	Comments
1	N627T	Walnut St	Front St	Wilmington	46	
2	N307	Adams St	11th St / I-95 SB off-ramp	Wilmington	29	
3	N179	US 13	Memorial Dr / Hazeldell Ave	New Castle	28	
4	N217	US 13	Boulden Blvd / Bacon Ave	New Castle	21	
5	N288	SR 52 (Delaware Ave)	Jackson St	Wilmington	19	
6	N741	US 40	Glasgow Dr	New Castle	18	
7	N332	US 40	Scotland Dr	New Castle	18	Existing Camera Location
8	N483	US 40	SR 896	New Castle	17	Existing Camera Location
9	N191	SR 58 (Churchmans Rd)	I-95 / SR 1 SB / SR 7 SB ramps	New Castle	17	
10	N676	SR 141 (Powder Mill Rd)	W Park Dr / US 202 SB off-ramp	New Castle	16	
11	N596	SR 58 (Churchmans Rd)	SR 7 NB ramps / Geoffrey Dr	New Castle	16	Existing Camera Location
12	N522	SR 273 (Christiana Rd)	SR 1 SB ramps	New Castle	16	
13	N187	US 40	Glasgow Ave	New Castle	16	
14	S121	SR 1	US 9	Sussex	16	
15	N405	Milltown Rd	McKennans Church Rd	New Castle	15	
16	N239	US 40	SR 72	New Castle	15	Existing Camera Location
17	K112	US 13	Martin Luther King Jr Blvd	Dover	15	
18	N102	US 202	Silverside Rd	New Castle	15	
19	N579	SR 141 (Powder Mill Rd)	Childrens Dr / Powder Mill Rd	New Castle	14	
20	N165	SR 2	SR 7 (Limestone Rd)	New Castle	14	Existing Camera Location
21	N163	SR 141 (Centre Rd)	SR 34 (Faulkland Rd)	New Castle	14	
22	N462	SR 72 (S Chapel St)	Kenmar Dr / Pencader Plaza	New Castle	13	
23	N242	SR 4	Salem Church Rd / SR 273 Connector	New Castle	13	
24	N185	US 40	SR 7 (Bear Corbitt Rd / Bear Christiana Rd)	New Castle	13	
25	S136	SR 1	SR 16 (Broadkill Rd)	Sussex	13	
26	S110	US 113	SR 18 / SR 404 (Bridgeville Rd / Seashore Hwy)	Georgetown	13	
27	N346	SR 4	SR 72 (S Chapel St)	New Castle	12	
28	N218	US 13	Roosevelt Ave	New Castle	12	Existing Camera Location
29	N182	SR 72 (S Chapel St / Sunset Lake Rd)	Old Baltimore Pk	New Castle	12	
30	N531	US 301 / SR 896 (Summit Bridge Rd)	Howell School Rd	New Castle	11	
31	K265T	North St	Governors Ave	Dover	11	Existing Camera Location
32	S183	US 113	SR 20 (Hardscrabble Rd) / Betts Pond Rd	Sussex	11	Existing Camera Location
33	S101	US 13	SR 16 (Market St)	Greenwood	11	
34	N035P	US 40	Governors Square	New Castle	11	
35	K009P	US 113	Milford Square / The Plaza at Milford	Milford	11	
36	N616T	Martin Luther King Jr Blvd	SR 4 (Maryland Ave) / Madison St	Wilmington	10	
37	N436T	SR 4 / SR 896 (Christina Pkwy)	SR 896 (S College Ave)	Newark	10	Existing Camera Location
38	N397	SR 4 WB (Justis St)	Marshall St	Newport	10	
39	N395	SR 4 WB (Justis St)	James St	Newport	10	
40	N317	SR 2	Red Mill Rd / Polly Drummond Hill Rd	New Castle	10	Existing Camera Location
41	S306	Herring Run Rd (Rd 534)	Seaford Village	Seaford	10	
42	N183	US 13	SR 273	New Castle	10	
43	K175T	SR 14	Washington St	Milford	10	
44	N114	Shipleigh Rd	Wilson Rd	New Castle	10	
45	S111	US 113	US 9 (W Market St)	Georgetown	10	
46	S109	US 13	SR 24 (Laurel Rd)	Sussex	10	
47	N040P	US 40	Eden Square	New Castle	10	
48	N006P	SR 58 (Churchmans Rd)	I-95 SB off-ramp	New Castle	10	
49	N605T	Martin Luther King Jr Blvd	West St	Wilmington	9	
50	N339	SR 273 (Christiana Rd)	SR 37 (Airport Rd) / Community Plaza	New Castle	9	
51	N318	SR 4	Stanton Rd	New Castle	9	
52	N271	4th St	Jackson St / I-95 SB off-ramp	Wilmington	9	
53	K262T	State St	North St	Dover	9	
54	N188	SR 896 (S College Ave)	Old Baltimore Pk	New Castle	9	
55	N173	SR 9 (New Castle Ave)	Memorial Dr / West Ave	New Castle	9	
56	N162	SR 2	SR 41 (Newport Gap Pk)	New Castle	9	Existing Camera Location
57	S160	US 113	SR 54 (Cemetery Rd)	Selbyville / Sussex	9	
58	N150	SR 141 / SR 100 (Centre Rd)	SR 100 (Montcharin Rd)	New Castle	9	
59	S112	US 113	SR 24 (Laurel Rd / Washington St)	Millsboro	9	
60	N104	US 202	Brandywine Blvd	New Castle	9	
61	N705	US 301 (Middletown Warwick Rd)	Diamond State Blvd / S Ridge Ave	Middletown	8	
62	N529	SR 7 (Limestone Rd)	Midway Plaza	New Castle	8	
63	N521	SR 273 (Christiana Rd)	SR 1 NB ramps	New Castle	8	
64	N422T	SR 2 / SR 72 (Capitol Tr)	Cleveland Ave / Woodlawn Ave	Newark	8	
65	N414T	S Main St	Apple Rd	Newark	8	
66	N364	SR 2	Delaplaine Ave / Red Mill Connector	New Castle	8	
67	N326	SR 92 (Naamans Rd)	Peachtree Rd / Society Dr	New Castle	8	
68	N323	SR 3 (Marsh Rd)	I-95 SB ramps	New Castle	8	
69	N305	Adams St	9th St / I-95 NB off-ramp	Wilmington	8	
70	N286	SR 261 (Foulk Rd)	Grubb Rd	New Castle	8	
71	N251	SR 3 (Marsh Rd)	Washington St Ext	New Castle	8	
72	K249	SR 14 (Milford Harrington Hwy)	SR 15 (Canterbury Rd) / Holly Hill Rd	Milford / Kent	8	
73	K239	US 113	Buccaneer Blvd / Milford Airpark Plaza	Milford	8	
74	S207	SR 1	Munchy Branch Rd (Rd 270A) / Miller Rd (Rd 270B)	Sussex	8	Existing Camera Location
75	K199	US 13	Scarborough Rd	Dover	8	Existing Camera Location
76	N193	US 13 / SR 72 (Wrangle Hill Rd)	US 13 / SR 7 (Bear Corbitt Rd)	New Castle	8	
77	N167	SR 7 (Limestone Rd)	Jane Way / Stanton Middle Schol	New Castle	8	
78	S162	US 113	SR 20 (Dagsboro Rd / Rd 334) / Handy Rd (Rd 337)	Sussex	8	
79	K113	US 13	S State St	Dover / Kent	8	
80	N101	US 202	SR 92 (Naamans Rd)	New Castle	8	Existing Camera Location
81	N686T	4th St	Walnut St	Wilmington	7	



**2015 Electronic Red Light Safety Program
Identification of Candidate Locations
May 6, 2015**

Legend			
Candidate Intersection	To Be Determined		
Eliminate Intersection			

Statewide Rank	Permit Number	Major Intersecting Road	Minor Intersecting Road	County or City	Red Light Crashes ('10-'14)	Comments
82	N585	US 13	Pine Tree Rd / Blackbird Landing Rd	New Castle	7	
83	N576	SR 72 (Wrangle Hill Rd)	SR 1 NB ramps	New Castle	7	
84	N570	SR 273 (Christiana Rd)	Prangs Ln	New Castle	7	
85	N506	SR 72 (Wrangle Hill Rd)	Porter Rd	New Castle	7	
86	N460	SR 273 (Christiana Rd)	Appleby Rd / Villas Dr	New Castle	7	
87	N406	SR 58 (Churchmans Rd)	Christiana Hospital / Center Pointe Plaza	New Castle	7	
88	N398	SR 4 EB (Market St)	Marshall St	Newport	7	
89	N325	SR 141 SB (Basin Rd)	Airport Rd	New Castle	7	
90	N313	SR 9 (New Castle Ave)	Cherry Ln / I-295 NB off-ramp	New Castle	7	
91	N290	SR 58 (Churchmans Rd)	SR 37 (Airport Rd)	New Castle	7	
92	N245	US 13	SR 299 (Main St)	Odessa	7	
93	S236	SR 16 (Milton Ellendae Hwy)	SR 30 (Gravel Hill Rd / Isaacs Rd)	Sussex	7	
94	N233	SR 7 (Limestone Rd)	Milltown Rd	New Castle	7	
95	K201	US 13	SR 1 ramps / Simon's Corner	Smyrna	7	
96	N192	SR 273 (Christiana Rd)	SR 7 (Bear Christiana Rd / E Main St)	New Castle	7	Existing Camera Location
97	N181	SR 279 (Elkton Rd)	Otts Chapel Rd	Newark / New Castle	7	
98	N178	US 13 / US 13 Bus	US 13 (S Heald St)	New Castle	7	
99	N172	SR 9 (New Castle Ave)	Landers Ln / Riverview Dr / Killoran Dr	New Castle	7	
100	N156	SR 141 / SR 100 (Centre Rd)	SR 48 / SR 100 (Lancaster Pk)	New Castle	7	
101	N146	SR 92 (Naamans Rd)	SR 261 (Fouk Rd)	New Castle	7	
102	S144	US 113	Shortly Rd (Rd 431) / Bedford St (US 9 Tr / Rd 431)	Sussex	7	
103	N143	SR 3 (Marsh Rd)	Grubb Rd / Harvey Rd / Sherwood Rd	New Castle	7	
104	N141	Silverside Rd	Veale Rd	New Castle	7	
105	K135	SR 10 (Lebanon Rd)	S State St	Kent	7	
106	S125	SR 1	SR 24 (John J Williams Hwy)	Sussex	7	
107	K118	US 13	Webbs Ln	Dover	7	Existing Camera Location
108	N109	US 202	Murphy Rd / Powder Mill Rd	New Castle	7	
109	K101	US 13	SR 6 (Commerce St)	Smyrna	7	
110	N028P	US 202	Concord Mall (north) / Rocky Run Pkwy	New Castle	7	
111	N552	US 40	Church Rd / Wellington Dr	New Castle	6	
112	N517	US 40	Walther Rd / Glendale Blvd	New Castle	6	
113	N514	US 40	Wilton Blvd	New Castle	6	
114	N504	Silverside Rd	Talleyville Center / Talleyville Town Shoppes	New Castle	6	
115	N491	SR 41 (Newport Gap Pk)	Graves Rd	New Castle	6	
116	N435T	SR 896 (S College Ave)	Old Chestnut Hill Rd / W Chestnut Hill Rd	Newark	6	
117	N423T	SR 2 / SR 72 (Library Ave / Capitol Tr)	SR 273 (Ogletown Rd) / E Main St	Newark	6	
118	N409	US 13	Rd 381 (Bear Rd / Hamburg Rd)	New Castle	6	
119	N393	US 40	Porter Rd / Salem Church Rd	New Castle	6	
120	N381	Old Baltimore Pk	Salem Church Rd / Salem Woods Dr	New Castle	6	Existing Camera Location
121	N371	US 301 / SR 896 / SR 71 (Summit Bridge Rd)	SR 896 (Boyd's Corner Rd) / Churchtown Rd	New Castle	6	
122	N369	SR 4	SR 58 (Churchmans Rd) / Delaware Park	New Castle	6	
123	N356	SR 7 (Limestone Rd)	New Linden Hill Rd / Goldy-Beacom College	New Castle	6	
124	N355	SR 141 (Basin Rd)	University Ave	New Castle	6	
125	N312	SR 4	Harmony Rd	New Castle	6	
126	N297	SR 48 (Lancaster Pk)	Centerville Rd	New Castle	6	
127	N248	SR 2	Meadowood Dr	New Castle	6	
128	N213	SR 261 (Fouk Rd)	Shipley Rd	New Castle	6	
129	N168	Centerville Rd	Boxwood Rd	New Castle	6	
130	N166	SR 2	SR 72 (Possum Park Rd) / Possum Park Mall	New Castle	6	
131	N159	SR 41 (Lancaster Pk)	Yorklyn Rd	New Castle	6	
132	N153	Elkton Rd (SR 279 / SR 896)	Christina Pkwy (SR 4 / SR 896) / Suburban Plaza	Newark	6	Existing Camera Location
133	N144	SR 92 (Naamans Rd)	SR 3 (Marsh Rd)	New Castle	6	
134	K133	US 13	SR 10 Alt (Walnut Shade Rd / Rd 30)	Kent	6	
135	K131	Bay Rd	Martin Luther King Jr Blvd / S Little Creek Rd	Dover	6	
136	K128	US 13	SR 10 (Camden Wyoming Ave / W Lebanon Rd)	Camden	6	
137	N127	Philadelphia Pk (US 13 Bus / SR 3)	SR 3 (Edgemoor Rd) / Shipley Rd	New Castle	6	
138	K117	US 113	SR 14 (Milford Harrington Hwy / N Front St)	Milford	6	
139	S104	SR 17 (Roxana Rd)	SR 20 (Pyle Center Rd / Zion Church Rd)	Sussex	6	
140	S103	US 13	SR 404 (Seashore Hwy) / Main St (US 13 Bus / SR 404 Bus)	Bridgeville / Sussex	6	
141	K018P	SR 10 (Lebanon Rd)	Gateway South / Wawa	Kent	6	
142	N703T	SR 299 (W Main St)	Industrial Dr	Middletown	5	
143	N660	US 202	SR 141 / SR 261 on-ramps / "Ramps B & E"	New Castle	5	
144	N595	SR 7 (Stanton Christiana Rd)	AAA Blvd / Border Café	New Castle	5	
145	N591	SR 273 (Newark Christiana Rd)	Salem Church Rd / SR 4 Connector	New Castle	5	
146	N541	US 40	Peoples Plaza	New Castle	5	
147	N532	US 301 / SR 896 (Summit Bridge Rd)	Denny Rd	New Castle	5	
148	N520	US 40	SR 1 SB ramps	New Castle	5	
149	N519	US 40	SR 1 NB ramps	New Castle	5	
150	N486	US 40	Pleasant Valley Rd	New Castle	5	
151	N485	SR 7 (Bear Christiana Rd)	Newtown Rd	New Castle	5	
152	N484	US 13 (Governor Printz Blvd)	SR 3 (Edgemoor Rd)	New Castle	5	
153	N475	SR 58 (Churchmans Rd)	Del Tech / Geoffrey Dr	New Castle	5	
154	N470	SR 4	Prides Crossing / Allandale Village Apts	New Castle	5	
155	N469	SR 2	Green Valley Dr	New Castle	5	
156	N453	US 13	Paddock Rd (Rd 30) / Joe Goldsborough Rd (Rd 487)	New Castle	5	
157	N366	SR 7 (Stanton Christiana Rd)	SR 4 (Ogletown Stanton Rd)	New Castle	5	
158	N362	SR 72 (Paper Mill Rd)	SR 72 (Possum Park Rd) / Thompson Station Rd	New Castle	5	
159	N324	Harvey Rd	I-95 NB off-ramp	New Castle	5	
160	N293	SR 52 (Kennett Pk)	SR 82 (Campbell Rd) / Kirk Rd	New Castle	5	
161	N285	SR 2	Farrand Dr	New Castle	5	
162	K278	US 13	S Carter Rd / Pharmacy Dr	Smyrna / Kent	5	



**2015 Electronic Red Light Safety Program
Identification of Candidate Locations
May 6, 2015**

Legend			
Candidate Intersection	To Be Determined	To Be Determined	To Be Determined
Eliminate Intersection	To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined	To Be Determined
To Be Determined	To Be Determined	To Be Determined	To Be Determined

Statewide Rank	Permit Number	Major Intersecting Road	Minor Intersecting Road	County or City	Red Light Crashes ('10-'14)	Comments
163	N272	SR 2	SR 100 (Dupont Rd)	Elsmere	5	Existing Camera Location
164	N255	SR 4	Marrows Rd	New Castle	5	Existing Camera Location
165	N243	SR 71 (Summit Bridge Rd)	Rd 25 (Pine Tree Rd / Main St)	Townsend / New Castle	5	
166	K236	US 13	Rustic Ln	Dover	5	
167	N225	SR 4 / SR 7 (Main St / Mitch Rd)	SR 7 (Limestone Rd)	New Castle	5	
168	S214	US 13	Trussum Pond Rd (Rd 462)	Sussex	5	
169	S209	US 113	SR 26 (Clayton St / Nine Foot Rd)	Dagsboro / Sussex	5	
170	N195	SR 4 (Maryland Ave)	SR 100 (S Dupont Rd)	New Castle	5	
171	S189P	SR 24 (John J Williams Hwy)	Rehoboth Mall	Sussex	5	
172	N177	US 13 (S Heald St)	Rogers Rd	New Castle	5	
173	N176	Salem Church Rd	Chapman Rd / Oakdale Rd	New Castle	5	
174	N140	SR 3 (Marsh Rd)	Veale Rd / Wilson Rd	New Castle	5	
175	S133	US 113	Rd 207 (Johnson Rd / Fitzgeralds Rd)	Sussex	5	
176	K132	US 113	Airport Rd / NW 10th St	Milford	5	
177	S127	SR 24 (John J Williams Hwy)	Rd 22 (SR 23 / SR 5 / Indian Mission Rd / Long Neck Rd)	Sussex	5	
178	K123	US 13	SR 14 (Clark St / Milford Harrington Hwy)	Harrington	5	
179	N085P	SR 92 (Naamans Rd)	Brandywine Town Center / Stratford Apts	New Castle	5	
180	N036P	SR 7 (Bear Christiana Rd)	Songsmith Dr	New Castle	5	
181	N030P	US 202	Brandywine Town Center	New Castle	5	
182	K019P	US 13	Thomas Harmon Dr / Honda Dealer	Camden / Kent	5	
183	K002P	Bay Rd	Blue Hen Mall (north)	Dover	5	
184	K001P	US 13	Dover Downs	Dover	5	

APPENDIX

C



2015 Electronic Red Light Safety Program Identification of Candidate Locations August 27, 2015

Legend	
	Candidate Intersection
	Eliminate Intersection

Statewide Rank	Permit Number	Major Intersecting Road	Minor Intersecting Road	County or City	Signal Phasing		RLR Crashes By At-Fault Approach										Maximum Crashes by At-Fault Approach	Total Angle Crashes (1/10-12/14)	Angle Crash Timeline
							NB		SB		EB		WB		Unk./ Other				
					Major	Minor	Left	Thru	Left	Thru	Left	Thru	Left	Thru					
1	N179	US 13	Memorial Dr / Hazeldell Ave	New Castle	Prot-Only / FRA	Split	2	20	0	4	0	0	0	2	4	22	32		
2	N741	US 40	Glasgow Dr	New Castle	Prot-Only	Split	0	0	0	0	0	1	0	19	3	19	23		
3	N405	Milltown Rd	McKennans Church Rd	New Castle	Prot-Perm	Split	0	0	0	0	0	2	0	16	2	16	20		
4	N462	SR 72 (S Chapel St)	Kenmar Dr / Pencader Plaza	New Castle	SB Prot-Perm	Split	0	4	0	15	0	0	0	0	5	15	24		
5	N217	US 13	Boulden Blvd / Bacon Ave	New Castle	Prot-Only	Split	4	4	7	6	0	1	0	0	4	13	26		
6	N522	SR 273 (Christiana Rd)	SR 1 SB ramps	New Castle	Prot-Only	One Way	0	0	0	0	0	13	2	3	2	13	20		
7	N040P	US 40	Eden Square	New Castle	Prot-Only	T-Intersection	1	0	0	0	0	13	0	0	1	13	15		
8	N191	SR 58 (Churchmans Rd)	I-95 / SR 1 SB / SR 7 SB ramps	New Castle	Prot-Only	One Way	0	0	0	4	2	10	2	4	4	12	26		
9	N242	SR 4	Salem Church Rd / SR 273 Connector	New Castle	Prot-Only	Prot-Only	1	0	3	1	0	11	0	1	1	11	18		
10	N579	SR 141 (Powder Mill Rd)	Childrens Dr / Powder Mill Rd	New Castle	Prot-Only	Prot-Only	1	1	0	1	4	6	1	2	5	10	21		
11	N006P	SR 58 (Churchmans Rd)	I-95 SB off-ramp	New Castle	Concurrent	One Way	0	0	1	0	0	1	0	10	2	10	14		
12	S110	US 113	SR 18 / SR 404 (Bridgeville Rd / Seashore Hwy)	Georgetown	Prot-Only	Prot-Only	8	1	3	4	0	2	0	0	0	9	18		
13	N185	US 40	SR 7 (Bear Corbitt Rd / Bear Christiana Rd)	New Castle	Prot-Only	Split	0	0	0	1	8	1	5	0	2	9	17		
14	S136	SR 1	SR 16 (Broadkill Rd)	Sussex	Prot-Only	Split	0	2	0	9	0	2	0	0	0	9	13		
15	N531	US 301 / SR 896 (Summit Bridge Rd)	Howell School Rd	New Castle	Prot-Perm	Concurrent	0	9	0	0	0	1	0	0	2	9	12		
16	N102	US 202	Silverside Rd	New Castle	Prot-Only	T-Intersection	0	9	3	0	0	0	0	0	0	9	12		
17	N187	US 40	Glasgow Ave	New Castle	Prot-Only	Split	0	3	0	8	0	4	1	0	0	8	16		
18	K112	US 13	Martin Luther King Jr Blvd	Dover	NB FRA	Split	0	3	0	8	0	0	0	2	0	8	13		
19	N395	SR 4 WB (Justis St)	James St	Newport	One Way	One Way	0	0	0	8	0	0	0	1	1	8	10		
20	N721	US 301 / SR 896 (Summit Bridge Rd)	Summit Village Shopping Centre / Shoppes of Mt. Pleasant	New Castle	Prot-Perm	Concurrent	0	0	0	8	0	1	0	0	0	8	9		
21	S121	SR 1	US 9	Sussex	Prot-Only	Lefts Prohibited	2	2	0	7	0	7	0	3	1	7	22		
22	N163	SR 141 (Centre Rd)	SR 34 (Faulkland Rd)	New Castle	Prot-Only	Prot-Only	3	4	0	1	0	1	3	2	5	7	19		
23	N676	SR 141 (Powder Mill Rd)	W Park Dr / US 202 SB off-ramp	New Castle	Prot-Perm	Prot-Only	0	0	1	3	0	7	0	5	2	7	18		
24	S112	US 113	SR 24 (Laurel Rd / Washington St)	Millsboro	Prot-Only	Prot-Only	1	3	2	5	0	0	0	6	1	7	18		
25	N346	SR 4	SR 72 (S Chapel St)	New Castle	Prot-Only	Prot-Only	0	0	0	7	1	1	2	2	3	7	16		
26	N035P	US 40	Governors Square	New Castle	Prot-Only	Split	0	0	0	0	3	4	1	6	1	7	15		
27	N318	SR 4	Stanton Rd	New Castle	Concurrent	Prot-Perm	0	2	1	0	1	0	0	7	1	7	12		
28	K239	US 113	Buccaneer Blvd / Milford Airpark Plaza	Milford	Prot-Only	Split	2	4	0	5	0	0	0	0	0	6	11		
29	N188	SR 896 (S College Ave)	Old Baltimore Pk	New Castle	Prot-Only	Split	0	6	0	4	1	0	0	0	0	6	11		
30	K175T	SR 14	Washington St	Milford	Prot-Perm	Concurrent	0	0	0	1	0	6	0	3	1	6	11		
31	K113	US 13	S State St	Dover / Kent	Prot-Only	Prot-Perm	0	6	0	3	0	0	0	1	1	6	11		
32	S111	US 113	US 9 (W Market St)	Georgetown	Prot-Only	Prot-Only	1	5	1	2	1	0	1	0	0	6	11		
33	N414T	S Main St	Apple Rd	Newark	Prot-Perm	Split	0	6	0	2	0	0	1	0	1	6	10		
34	S306	Herring Run Rd (Rd 534)	Seaford Village	Seaford	Prot-Perm	Split	0	0	0	0	0	6	0	4	0	6	10		
35	S162	US 113	SR 20 (Dagsboro Rd / Rd 334) / Handy Rd (Rd 337)	Sussex	Prot-Only	Split	0	2	1	5	0	1	0	1	0	6	10		
36	N364	SR 2	Delaplane Ave / Red Mill Connector	New Castle	Prot-Only	Concurrent	0	0	0	0	0	6	0	3	0	6	9		
37	N104	US 202	Brandywine Blvd	New Castle	Concurrent	T-Intersection	0	6	0	1	0	0	0	1	1	6	9		
38	N397	SR 4 WB (Justis St)	Marshall St	Newport	One Way	One Way	2	4	0	0	0	0	0	1	1	6	8		
39	N167	SR 7 (Limestone Rd)	Jane Way / Stanton Middle School	New Castle	Prot-Perm	Concurrent	0	0	0	6	0	0	0	0	1	6	7		
40	N182	SR 72 (S Chapel St / Sunset Lake Rd)	Old Baltimore Pk	New Castle	Prot-Only	Prot-Only	2	3	1	4	0	2	0	2	3	5	17		
41	N326	SR 92 (Naamans Rd)	Peachtree Rd / Society Dr	New Castle	Prot-Only	Prot-Only	2	0	1	4	0	0	0	2	3	5	12		
42	N114	Wilson Rd	Shipley Rd	New Castle	Concurrent	Prot-Perm	0	5	0	1	0	2	0	2	2	5	12		
43	S109	US 13	SR 24 (Laurel Rd)	Sussex	Prot-Only	Split	0	4	3	2	0	0	0	2	1	5	12		
44	N173	SR 9 (New Castle Ave)	Memorial Dr / West Ave	New Castle	Prot-Perm	Split	0	2	0	5	0	1	0	1	2	5	11		
45	N150	SR 141 / SR 100 (Barley Mill Rd)	SR 100 (Montchanin Rd)	New Castle	Prot-Only	SB Prot-Perm	0	0	0	0	0	5	0	5	1	5	11		
46	K009P	US 113	Milford Square / The Plaza at Milford	Milford	Prot-Only	Split	0	4	1	4	1	0	0	1	0	5	11		
47	N529	SR 7 (Limestone Rd)	Midway Plaza	New Castle	Prot-Only	Sig. Right Turn	0	0	0	5	0	0	0	0	2	5	7		
48	N183	US 13	SR 273	New Castle	Prot-Only	Split	2	2	0	3	0	1	1	1	4	4	14		
49	S101	US 13	SR 16 (Market St)	Greenwood	Concurrent	Prot-Perm	1	2	0	2	0	3	0	4	0	4	12		
50	N705	US 301 (Middletown Warwick Rd)	Diamond State Blvd / S Ridge Ave	Middletown	Prot-Only	Prot-Only	0	4	0	4	0	0	2	0	0	4	10		
51	K262T	State St	North St	Dover	Concurrent	Concurrent	0	2	0	4	0	1	0	0	3	4	10		
52	N193	US 13 / SR 72 (Wrangle Hill Rd)	US 13 / SR 7 (Bear Corbitt Rd)	New Castle	Prot-Only	Prot-Only	0	2	0	4	1	2	0	0	0	4	9		
53	S160	US 113	SR 54 (Cemetery Rd)	Selbyville / Sussex	Prot-Only	Concurrent	0	4	0	0	0	0	1	3	1	4	9		
54	N521	SR 273 (Christiana Rd)	SR 1 NB ramps	New Castle	Prot-Only	One Way	1	0	0	0	1	3	0	1	2	4	8		
55	N422T	SR 2 / SR 72 (Capitol Tr)	Cleveland Ave / Woodlawn Ave	Newark	Split	Split	0	4	0	3	0	0	0	0	0	4	7		

APPENDIX

D



2015 Electronic Red Light Safety Program Evaluation of At-Fault Crashes at Existing Camera Sites August 27, 2015

Legend

Monitored Movement

Statewide Rank	Permit Number	Major Intersecting Road	Minor Intersecting Road	County or City	Signal Phasing		RLR Crashes By At-Fault Approach ¹										Maximum Crashes by At-Fault Approach	Total Angle Crashes (1/10-12/14)	Angle Crash Timeline
							NB		SB		EB		WB		Unk./Other				
					Major	Minor	Left	Thru	Left	Thru	Left	Thru	Left	Thru					
1	N332	US 40	Scotland Dr	New Castle	Prot-Only	Split	0	0	1	1	0	7	0	11	0	11	20		
2	N596	SR 58 (Churchmans Rd)	SR 7 NB ramps / Geoffrey Dr	New Castle	Prot-Only	One Way	0	0	0	1	3	5	1	8	1	9	19		
3	N483	US 40	SR 896	New Castle	Prot-Only	Prot-Only	2	5	2	2	4	1	0	5	3	7	24		
4	N218	US 13	Roosevelt Ave	New Castle	Lefts Prohibited	Thrus Prohibited	0	5	0	7	0	0	1	0	0	7	13		
5	S183	US 113	SR 20 (Hardscrabble Rd) / Betts Pond Rd	Sussex	Prot-Only	Concurrent	1	6	0	4	0	1	0	1	0	7	13		
6	K265T	North St	Governors Ave	Dover	Concurrent	Concurrent	1	6	0	4	0	1	0	0	0	7	12		
7	N239	US 40	SR 72	New Castle	Prot-Only	Prot-Only	2	3	4	2	0	2	0	2	6	6	21		
8	N436T	SR 4 / SR 896 (Christina Pkwy)	SR 896 (S College Ave)	Newark	Prot-Only	Prot-Only	2	1	1	0	0	6	0	0	1	6	11		
9	S207	SR 1	Munchy Branch Rd (Rd 270A) / Miller Rd (Rd 270B)	Sussex	Prot-Only	Split	0	3	1	5	0	0	0	0	0	6	9		
10	K199	US 13	Scarborough Rd	Dover	Prot-Only	Prot-Only	0	5	0	1	0	0	0	1	3	5	10		
11	N162	SR 2	SR 41 (Newport Gap Pk)	New Castle	Prot-Only	Split	0	0	0	1	0	5	0	2	1	5	9		
12	N165	SR 2	SR 7 (Limestone Rd)	New Castle	Prot-Only	Prot-Only	1	2	1	3	1	2	1	3	1	4	15		
13	N192	SR 273 (Christiana Rd)	SR 7 (Bear Christiana Rd / E Main St)	New Castle	Prot-Only	Split	0	1	0	0	0	4	2	2	0	4	9		
14	N101	US 202	SR 92 (Naamans Rd)	New Castle	Prot-Only	Prot-Only	0	4	2	1	0	0	0	0	2	4	9		
15	N381	Old Baltimore Pk	Salem Church Rd / Salem Woods Dr	New Castle	WB Prot-Only EB Prot-Perm	Split	0	2	0	0	0	0	0	4	1	4	7		
16	N153	Elkton Rd (SR 279 / SR 896)	Christina Pkwy (SR 4 / SR 896) / Suburban Plaza	Newark	Prot-Only	Prot-Only	2	2	2	0	0	1	0	0	0	4	7		
17	K118	US 13	Webbs Ln	Dover	FRA	Split	0	4	0	3	0	0	0	0	0	4	7		
18	S216	US 13	Rd 534 (Tharp Rd / Herring Run Rd)	Seaford	Prot-Only	Split	1	0	0	4	0	0	0	1	0	4	6		
19	N317	SR 2	Red Mill Rd / Polly Drummond Hill Rd	New Castle	Prot-Only	Prot-Only	0	1	1	1	0	3	1	1	3	3	11		
20	N255	SR 4	Marrows Rd	New Castle	Prot-Only	Prot-Only	0	0	0	1	2	1	0	2	2	3	8		
21	N337	SR 273 (Christiana Rd)	Harmony Rd / Gerald Dr	New Castle	Prot-Only	Split	0	0	0	1	1	2	0	3	0	3	7		
22	S195	SR 1	Old Landing Rd	Sussex	Prot-Only	T-Intersection	0	0	0	3	1	0	0	0	0	3	4		
23	K148	US 13	Roosevelt Ave	Dover	FRA	Concurrent	1	0	1	2	0	0	0	0	0	3	4		
24	K134	US 13	Kings Hwy / White Oak Rd	Dover	Prot-Only	Split	0	1	1	2	0	0	0	0	0	3	4		
25	K109	US 13	SR 8 (Division St)	Dover	Prot-Only	Split	0	0	0	3	0	0	0	0	1	3	4		
26	K110	US 13	Loockerman St	Dover	Prot-Only	Split	0	3	0	0	0	0	0	0	0	3	3		
27	S269	US 13	Redden Rd (Rd 40)	Sussex	Prot-Only	EB Prot-Perm	0	1	1	1	0	0	0	0	0	2	3		
28	N272	SR 2	SR 100 (Dupont Rd)	Elsmere	Prot-Perm	Prot-Perm	0	1	0	1	0	1	1	0	3	1	7		
29	N331	SR 92 (Naamans Rd)	Shipley Rd / Brandywine Town Center	New Castle	Prot-Only	Thrus Prohibited	0	0	1	0	0	0	0	0	0	1	1		
30	N301	SR 2	Harmony Rd	New Castle	Prot-Only	T-Intersection	0	0	0	0	0	0	0	0	0	0	0		

¹The locations below had red light cameras installed in the year 2010; part of the 5-year crash analysis includes a short period prior to camera installation

Statewide Rank	Permit Number	Intersection	County or City	Red Light Camera Installation Date	Crashes Prior to Camera Installation	Comments
2	N596	SR 58 (Churchmans Rd) at SR 7 NB ramps / Geoffrey Dr	New Castle	7/13/2010	2	One WBT at-fault, a monitored approach
9	S207	SR 1 at Munchy Branch Rd (Rd 270A) / Miller Rd (Rd 270B)	Sussex	6/5/2010	1	NBT at-fault, not a monitored approach in 2010
10	K199	US 13 at Scarborough Rd	Dover	7/23/2010	1	Unknown at-fault crash involving two unmonitored approaches
13	N192	SR 273 (Christiana Rd) at SR 7 (Bear Christiana Rd / E Main St)	New Castle	9/1/2010	2	One WBT at-fault and one NBT at-fault, monitored approaches
15	N381	Old Baltimore Pk at Salem Church Rd / Salem Woods Dr	New Castle	6/21/2010	0	
19	N317	SR 2 at Red Mill Rd / Polly Drummond Hill Rd	New Castle	8/6/2010	0	
21	N337	SR 273 (Christiana Rd) at Harmony Rd / Gerald Dr	New Castle	8/13/2010	1	One EBT at-fault, a monitored approach
22	S195	SR 1 at Old Landing Rd	Sussex	6/5/2010	0	
29	N331	SR 92 (Naamans Rd) at Shipley Rd / Brandywine Town Center	New Castle	6/18/2010	0	
30	N301	SR 2 at Harmony Rd	New Castle	5/31/2010	0	

APPENDIX

E



MEMORANDUM of MEETING

Date: September 14, 2015

Date of Meeting: August 27, 2015

Time of Meeting: 1:00 PM

Meeting Location: Newark Room, TMC

Meeting Description: ERLSP Site Selection

CC: Attendees

Work Order Number: 31957-018

Project: Electronic Red Light Safety Program

Participants:

Name	Company	Email
Matt Buckley	WRA	mbuckley@wrallp.com
Jim Clacher	DelDOT Traffic	jim.clacher@state.de.us
Steve Harr	WRA	sharr@wrallp.com
Denny Hehman	DelDOT Traffic	denny.hehman@state.de.us
Monroe Hite, III	DelDOT Traffic	monroe.hite@state.de.us
Mark Luszczyk	DelDOT Traffic	mark.luszczyk@state.de.us
Nicole Majeski	DelDOT	nicole.majeski@state.de.us
Tom Meyer	DelDOT Traffic	tom.meyer@state.de.us
Dana Trone	WRA	dtrone@wrallp.com
Adam Weiser	DelDOT Traffic	adam.weiser@state.de.us

The purpose of this meeting was to discuss the ERLSP candidate location selection process. The following is a summary of the discussions.

- Steve discussed the methodology for identifying candidate locations. The locations of over 3,700 statewide crashes with “Primary Contributing Circumstance: Disregard Traffic Signal” or “Driver Action: Ran Red Light” from January 2010 through December 2014 were geo-referenced to signals with DelDOT permit numbers. Locations were eliminated if they were maintained by the City of Wilmington or if red light camera enforcement was already present. For the remaining sites, police crash reports were reviewed for intersections with 8 or more red light running (RLR) crashes to determine the “at-fault” approaches. The final candidate list is sorted by the intersections with the highest at-fault approach crash totals (left plus through at-fault crashes).
- Matt recommended that a final candidate list be provided to Xerox so that video validation can commence while WRA makes final field observations and yellow and red interval calculations. The group agreed that performing the final analysis steps concurrently to save time would be beneficial.
- WRA presented a list of the candidate intersections including a summary of the crashes by at-fault approach and a timeline of angle crashes at the intersection to aid discussion of potential effects of known changes during the study period (signal retimings, repaving, widening, etc.).

- **Rank 1 – US 13 at Memorial Drive / Hazeldell Avenue**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 2 – US 40 at Glasgow Drive**
 - Mark asked if backplates should be added and Tom asked if there were any time of day patterns. Steve responded that despite some of the crash narratives mentioning sun glare as a factor, crashes were spread evenly throughout the day.
 - Denny noted that a recent pave and rehab project occurred on US 40, but the group stated that it did not significantly impact this intersection or the angle crash rate.
 - The group agreed to keep this intersection as a candidate location.
- **Rank 3 – Milltown Road at McKennans Church Road**
 - Matt stated this intersection is currently scheduled to be rebuilt relatively soon, which should address some of the sign clutter and driver confusion issues. Additionally, this intersection is a poor candidate location due to the proximity of the SR 7 at Milltown Road intersection.
 - The group agreed to eliminate this intersection as a candidate location.
- **Rank 4 – SR 72 (S. Chapel Street) at Kenmar Drive / Pencader Plaza**
 - Adam noted that southbound traffic queues back to/through the SR 4 at SR 72 intersection to the north.
 - Jim noted that this signal is on a separate signal system than the SR 72 at SR 4 signal.
 - The group agreed to keep this intersection as a candidate location.
- **Rank 5 – US 13 at Boulden Boulevard / Bacon Avenue**
 - Due to fewer crashes toward the end of the study period, the group suggested a review of 2015 crashes to date to supplement the available data prior to reaching a judgement on whether to include or eliminate as a candidate location.
 - *After the meeting, crash reports at the intersection were reviewed from January 2015 to August 2015 – three additional red-light-running crashes occurred during this period, including two more on the southbound max at-fault approach. It is recommended that this site remain as a candidate location.*
- **Rank 6 – SR 273 (Christiana Road) at SR 1 SB ramps**
 - Nicole asked how this intersection would be impacted by the SR 1 / SR 273 / SR 7 interchange project and how many years away that project would likely occur. Mark responded that the project is expected to be many years out and may not totally reconfigure the alignments of the roadways and ramps.
 - The group agreed to keep this intersection as a candidate location.
- **Rank 7 – US 40 at Eden Square**
 - Due to fewer crashes toward the end of the study period, the group suggested a review of 2015 crashes to date to supplement the available data prior to reaching a judgement on whether to include or eliminate as a candidate location.
 - *After the meeting, crash reports at the intersection were reviewed from January 2015 to August 2015 – one additional red-light-running crash occurred during this period. It is recommended that this site remain as a candidate location.*
- **Rank 8 – SR 58 (Churchmans Road) at I-95 / SR 1 SB / SR 7 SB ramps**
 - Matt stated that since there were no crashes during the last two years of the analysis period, this site should be eliminated
 - The group agreed to eliminate this intersection as a candidate location.
 - *After the meeting, an error in the crash timeline was discovered, which was preventing multiple crashes from being displayed properly on the timeline for this intersection, and there had been multiple crashes in 2013 and 2014. WRA confirmed with DeIDOT that this intersection should remain a candidate location.*



- **Rank 9 – SR 4 at Salem Church Road / SR 273 Connector**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 10 – SR 141 (Powder Mill Road) at Childrens Drive / Powder Mill Road**
 - Matt noted there is a significant horizontal curve on the “eastbound” SR 141 approach, which had the highest number of at-fault crashes. The group recommended that field sight distance measurements should be obtained.
 - The group agreed to eliminate this intersection as a candidate location and to consider implementing active engineering countermeasures, such as a RED SIGNAL AHEAD WHEN FLASHING warning sign.
 - *After the meeting, the signal sight distance was field measured on the eastbound approach. The first view of either through signal head occurs at 445 feet from the stop line, and unobstructed view of both through signal heads occurs at 350 feet from the stop line. DE MUTCD Table 4D-2 specifies a minimum sight distance of 460 feet for an approach speed of 45 MPH.*
- **Rank 11 – SR 58 (Churchmans Road) at I-95 SB off-ramp**
 - The group noted potential camera pole placement issues on the westbound approach, but agreed it still appeared feasible based on rough measurements on Google Earth and photos from Google Street View.
 - The group agreed to keep this intersection as a candidate location.
- **Rank 12 – US 113 at SR 18 / SR 404 (Bridgeville Road / Seashore Highway)**
 - Dana and Matt suggested the high number of left-turn at-fault crashes and the large size of the intersection may be indicative of insufficient change and clearance intervals.
 - Steve stated that northbound and southbound left turns receive 3 seconds yellow change and 2 seconds all-red clearance intervals, and these should be reviewed for probable increases.
 - The group agreed to eliminate this intersection as a candidate location and to complete a timesheet calculation package to implement increased yellow and red intervals as an engineering countermeasure.
- **Rank 13 – US 40 at SR 7 (Bear Corbitt Road / Bear Christiana Road)**
 - Similar to Rank 12, the group suggested that the high number of left-turn at-fault crashes and the large size of the intersection may be indicative of insufficient change and clearance intervals. The group recommended preparing a timesheet calculation package.
 - Steve stated that existing timings did reflect increased yellow and red intervals, but agreed a timesheet package should be prepared.
 - Due to fewer crashes toward the end of the study period, the group suggested a review of 2015 crashes to date to supplement the available data prior to reaching a judgement on whether to include or eliminate as a candidate location.
 - *After the meeting, crash reports at the intersection were reviewed from January 2015 to August 2015 – three additional red-light-running crashes had occurred during this period. Additionally, a timesheet package was completed and required increases to US 40 left-turn yellow and red intervals. These increases should be implemented as an engineering countermeasure and it is recommended this intersection be eliminated as a candidate location.*
- **Rank 14 – SR 1 at SR 16 (Broadkill Road)**
 - Mark stated that this signal has been rebuilt and lighting has been added. Adam requested a review of the 2015 crash data.
 - Monroe stated that a DelDOT project is currently planned to grade-separate this intersection by 2021.
 - The group agreed to eliminate this intersection as a candidate location.
 - Adam requested a review of crash data for 2015 due to the recently-implemented safety improvements.
 - *After the meeting, crash reports at the intersection were reviewed from January 2015 to August 2015 – one additional red-light-running crash occurred during this period.*



- **Rank 15 – US 301 / SR 896 (Summit Bridge Road) at Howell School Road**
 - Mark stated that this intersection will be realigned and under construction very soon.
 - The group agreed to eliminate this intersection as a candidate location.
- **Rank 16 – US 202 at Silverside Road**
 - The group noted that a recent pave and rehab project was completed on US 202.
 - Steve stated that signal retimings for the entire US 202 corridor were implemented on February 14, 2015.
 - The group agreed to keep this intersection as a candidate location.
- **Rank 17 – US 40 at Glasgow Avenue**
 - Steve stated that of the eight southbound Glasgow Avenue through at-fault crashes, two occurred at US 40 eastbound and six occurred at US 40 westbound.
 - Due to fewer crashes toward the end of the study period, the group suggested a review of 2015 crashes to date to supplement the available data prior to reaching a judgement on whether to include or eliminate as a candidate location.
 - *After the meeting, crash reports at the intersection were reviewed from January 2015 to August 2015 – one additional red-light-running crash occurred during this period. It is recommended that this site be considered as two separate intersections with a maximum at-fault approach of six crashes, resulting in a lower rank and recommended elimination as a candidate location.*
- **Rank 18 – US 13 at Martin Luther King Jr Boulevard**
 - Matt noted there is a significant horizontal curve on the southbound US 13 approach, which had the highest number of at-fault crashes and that an upcoming HEP project would provide a supplemental signal head for southbound traffic. This intersection has been eliminated from consideration in the past due to the horizontal curvature.
 - The group agreed to eliminate this intersection as a candidate location.
- **Rank 19 – SR 4 WB (Justis St) at James St**
 - Dana stated that this intersection was eliminated in previous site selection studies due to insufficient sight distance on the southbound approach, which had the highest number of at-fault crashes.
 - Adam and Mark stated there is also a signal rebuild project planned.
 - The group agreed to eliminate this intersection as a candidate location.
- **Rank 20 – US 301 / SR 896 (Summit Bridge Road) at Summit Village Shopping Centre / Shoppes of Mt. Pleasant**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 21 – SR 1 at US 9**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 22 – SR 141 (Centre Road) at SR 34 (Faulkland Road)**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 23 – SR 141 (Powder Mill Road) at W Park Drive / US 202 SB off-ramp**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 24 – US 113 at SR 24 (Laurel Road / Washington Street)**
 - Matt and Steve noted there is a significant horizontal curve on the southbound US 113 approach, which had the highest number of at-fault crashes and a skew to the westbound SR 24 approach, which also had a high crash total. A signal rebuild is currently under construction and backplates will be added.
 - The group agreed to eliminate this intersection as a candidate location.



- **Rank 25 – SR 4 at SR 72 (S Chapel Street)**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 26 – US 40 at Governors Square**
 - The group agreed to keep this intersection as a candidate location.
- **Rank 27 – SR 4 at Stanton Road**
 - Matt stated this intersection was just rebuilt with a supplemental westbound signal head.
 - The group agreed to eliminate this intersection as a candidate location.

The group also discussed potential additional monitoring at the existing 30 DeIDOT red light camera sites. WRA provided a similar ranked list of crashes at the intersections over a five-year period organized by at-fault approach. The top six sites had 7 or more red-light-running crashes on an approach that is not currently being monitored, which was the same threshold used on the candidate list for new intersections. Any additional approaches recommended for analysis will have violation and volume data analyzed by Xerox similar to the selected candidate sites.

- **Rank 1 – US 40 at Scotland Drive**
 - Eleven crashes on westbound approach (unmonitored), seven crashes on eastbound approach (monitored)
 - The group recommended the westbound US 40 approach for Xerox analysis.
- **Rank 2 – SR 58 (Churchmans Road) at SR 7 NB ramps / Geoffrey Drive**
 - Nine crashes on westbound approach (monitored), eight crashes on eastbound approach (unmonitored)
 - The group recommended the eastbound SR 58 approach for Xerox analysis.
- **Rank 3 – US 40 at SR 896**
 - Seven crashes on northbound approach (unmonitored), five crashes on eastbound approach (unmonitored), five crashes on westbound approach (monitored), four crashes on southbound approach (unmonitored)
 - The group recommended the northbound and southbound SR 896 approaches and the eastbound US 40 approach for Xerox analysis.
- **Rank 4 – US 13 at Roosevelt Ave (NCC)**
 - Seven crashes on southbound approach (unmonitored), five crashes on northbound approach (monitored)
 - The group recommended the southbound US 13 approach for Xerox analysis.
- **Rank 5 – US 113 at SR 20 (Hardscrabble Road) / Betts Pond Road**
 - Seven crashes on northbound approach (unmonitored), four crashes on southbound approach (monitored)
 - The group recommended the northbound US 113 approach for Xerox analysis.
- **Rank 6 – North Street at Governors Avenue**
 - Seven crashes on northbound approach (unmonitored), four crashes on southbound approach (monitored)
 - The group agreed that the northbound approach would not support camera pole installation and it would not be possible to monitor that approach.
 - Jim suggested signalization of the northbound left-turn as an engineering countermeasure.



- The group agreed to perform a video validation at the SR 2 at SR 100 (Dupont Road) intersection in order to confirm whether additional approaches should be monitored.
- Adam requested that WRA revise the current site selection methodology in response to the recent legislation and to reflect any other changes to the current methodology.
- Nicole requested that WRA send the draft list of locations to her for review prior to submission to Xerox.

The above is a memorandum of understanding between the parties regarding the topics discussed and the decisions reached. Any participants desiring to add to, or otherwise amend the minutes, are requested to put their comments in writing to the writer within seven (7) days; otherwise, the minutes will stand as written.



Steve Harr, PE, PTOE



APPENDIX

F



2015 Electronic Red Light Safety Program Video Validation Locations September 4, 2015

Statewide Rank	Permit Number	Major Intersecting Road	Minor Intersecting Road	County or Town	Xerox Video Validation Approaches	
					Directions	# of Approaches
Candidate Locations						
1	N179	US 13	Memorial Dr / Hazeldell Ave	New Castle	All	4
2	N741	US 40	Glasgow Dr	New Castle	EB, WB, SB	3
4	N462	SR 72 (S Chapel St)	Kenmar Dr / Pencader Plaza	New Castle	All	4
5	N217	US 13	Boulden Blvd / Bacon Ave	New Castle	All	4
6	N522	SR 273 (Christiana Rd)	SR 1 SB ramps	New Castle	All	3
7	N040P	US 40	Eden Square	New Castle	All	3
8	N191	SR 58 (Churchmans Rd)	I-95 / SR 1 SB / SR 7 SB ramps	New Castle	All	3
9	N242	SR 4	Salem Church Rd / SR 273 Connector	New Castle	All	4
11	N006P	SR 58 (Churchmans Rd)	I-95 SB off-ramp	New Castle	All	3
16	N102	US 202	Silverside Rd	New Castle	All	3
20	N721	US 301 / SR 896 (Summit Bridge Rd)	Summit Village Shopping Centre / Shoppes of Mt. Pleasant	New Castle	All	4
21	S121	SR 1	US 9	Sussex	All	4
22	N163	SR 141 (Centre Rd)	SR 34 (Faulkland Rd)	New Castle	All	4
23	N676	SR 141 (Powder Mill Rd)	W Park Dr / US 202 SB off-ramp	New Castle	All	4
25	N346	SR 4	SR 72 (S Chapel St)	New Castle	All	4
26	N035P	US 40	Governors Square	New Castle	All	4
Existing Locations						
1	N332	US 40	Scotland Dr	New Castle	WB	1
2	N596	SR 58 (Churchmans Rd)	SR 7 NB ramps / Geoffrey Dr	New Castle	EB	1
3	N483	US 40	SR 896	New Castle	NB, SB, EB	3
4	N218	US 13	Roosevelt Ave	New Castle	SB	1
5	S183	US 113	SR 20 (Hardscrabble Rd) / Betts Pond Rd	Sussex	NB	1
28	N272	SR 2	SR 100 (Dupont Rd)	Elsmere	NB, SB, WB	3
					Total	68

APPENDIX

G



2015 Electronic Red Light Safety Program Recommended Candidate Locations - Crash & Violation Data January 20, 2016

Statewide Rank	Permit Number	Major Intersecting Road	Minor Intersecting Road	County	Signal Phasing		RLR Crashes By At-Fault Approach								Maximum Crashes by At-Fault Approach	Total Angle Crashes (1/10-12/14)	Violations (6AM - 10 PM)									
							NB		SB		EB		WB				Unk./Other	NB		SB		EB		WB		Total
					Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru				Left	Thru	Left	Thru	Left	Thru			
1	N179	US 13	Memorial Dr / Hazeldell Ave	New Castle	Prot-Only / FRA	Split	2	20	0	4	0	0	0	2	4	22	32	7	58	22	23	0	1	0	4	115
2	N741	US 40	Glasgow Dr	New Castle	Prot-Only	Split	0	0	0	0	0	1	0	19	3	19	23			4	3	1	17	2	11	38
4	N462	SR 72 (S Chapel St)	Kenmar Dr / Pencader Plaza	New Castle	SB Prot-Perm	Split	0	4	0	15	0	0	0	0	5	15	24	0	67	1	36	17	2	10	0	133
5	N217	US 13	Boulden Blvd / Bacon Ave	New Castle	Prot-Only	Split	4	4	7	6	0	1	0	0	4	13	26	13	58	4	25	5	13	30	4	152
6	N522	SR 273 (Christiana Rd)	SR 1 SB ramps	New Castle	Prot-Only	One Way	0	0	0	0	0	13	2	3	2	13	20			25	0	3	12	9	0	49
7	N040P	US 40	Eden Square	New Castle	Prot-Only	T-Intersection	1	0	0	0	0	13	0	0	1	13	15	1	0			12	19	0	55	87
8	N191	SR 58 (Churchmans Rd)	I-95 / SR 1 SB / SR 7 SB ramps	New Castle	Prot-Only	One Way	0	0	0	4	2	10	2	4	4	12	26			5	61	2	5	36	5	114
9	N242	SR 4	Salem Church Rd / SR 273 Connector	New Castle	Prot-Only	Prot-Only	1	0	3	1	0	11	0	1	1	11	18	23	5	4	15	2	22	2	11	84
11	N006P	SR 58 (Churchmans Rd)	I-95 SB off-ramp	New Castle	Concurrent	One Way	0	0	1	0	0	1	0	10	2	10	14			9	0	0	14	0	12	35
16	N102	US 202	Silverside Rd	New Castle	Prot-Only	T-Intersection	0	9	3	0	0	0	0	0	0	9	12	0	29	0	16			3	3	51
20	N721	US 301 / SR 896 (Summit Bridge Rd)	Summit Village Shopping Centre / Shoppes of Mt. Pleasant	New Castle	Prot-Perm	Concurrent	0	0	0	8	0	1	0	0	0	8	9	0	14	1	26	2	0	4	2	49
21	S121	SR 1	US 9	Sussex	Prot-Only	Lefts Prohibited	2	2	0	7	0	7	0	3	1	7	22	0	23	0	6	9	1	11	0	50
22	N163	SR 141 (Centre Rd)	SR 34 (Faulkland Rd)	New Castle	Prot-Only	Prot-Only	3	4	0	1	0	1	3	2	5	7	19	55	9	4	15	13	6	73	4	179
23	N676	SR 141 (Powder Mill Rd)	W Park Dr / US 202 SB off-ramp	New Castle	Prot-Perm	Prot-Only	0	0	1	3	0	7	0	5	2	7	18	3	0	2	30	11	6	11	27	90
25	N346	SR 4	SR 72 (S Chapel St)	New Castle	Prot-Only	Prot-Only	0	0	0	7	1	1	2	2	3	7	16	12	4	0	2	11	3	100	11	143
26	N035P	US 40	Governors Square	New Castle	Prot-Only	Split	0	0	0	0	3	4	1	6	1	7	15	4	12	13	33	78	18	3	27	188

Existing 1	N332	US 40	Scotland Dr	New Castle	Prot-Only	Split	0	0	1	1	0	7	0	11	0	11	20							0	13	13
Existing 2	N596	SR 58 (Churchmans Rd)	SR 7 NB ramps / Geoffrey Dr	New Castle	Prot-Only	One Way	0	0	0	1	3	5	1	8	1	9	19					0	4			4
Existing 3	N483	US 40	SR 896	New Castle	Prot-Only	Prot-Only	2	5	2	2	4	1	0	5	3	7	24	1	3	1	3	8	3			19
Existing 4	N218	US 13	Roosevelt Ave	New Castle	Lefts Prohibited	Thrus Prohibited	0	5	0	7	0	0	1	0	0	7	13			0	9					9
Existing 5	S183	US 113	SR 20 (Hardscrabble Rd) / Betts Pond Rd	Sussex	Prot-Only	Concurrent	1	6	0	4	0	1	0	1	0	7	13	2	6							8
Existing 28	N272	SR 2	SR 100 (Dupont Rd)	Elsmere	Prot-Perm	Prot-Perm	0	1	0	1	0	1	1	0	3	7	7	2	0	0	1			0	0	3

LEGEND:

##	proposed monitored approach		highest at-fault crash approach, must be monitored		approach cannot be monitored due to constructability issues		approach is currently monitored
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APPENDIX

H



MEMORANDUM of MEETING

Date: January 27, 2016

Date of Meeting: January 20, 2016

Time of Meeting: 2:30 PM

Meeting Location: Newark Room, TMC

Meeting Description: ERLSP Monitored Approach Selection

CC: Attendees & Nicole Majeski

Work Order Number: 31957-018

Project: Electronic Red Light Safety Program

Participants:

Name	Agency	Email
Matt Buckley	WRA	mbuckley@wrallp.com
Jim Clacher	DelDOT Traffic	jim.clacher@state.de.us
Steve Harr	WRA	sharr@wrallp.com
Denny Hehman	DelDOT Traffic	denny.hehman@state.de.us
Mark Luszcz	DelDOT Traffic	mark.luszcz@state.de.us
Tom Meyer	DelDOT Traffic	tom.meyer@state.de.us
Dana Trone	WRA	dtrone@wrallp.com
Adam Weiser	DelDOT Traffic	adam.weiser@state.de.us

The purpose of this meeting was to discuss the selection of ERLSP monitored approaches. The following is a summary of the discussions.

- Dana updated the group on the progress since the August ERLSP candidate site selection meeting. WRA performed site visits at all candidate sites to identify any constraints and to collect signal timesheet data. Additionally, engineering countermeasures at three non-candidate sites were initiated:
 - Design is in progress for the installation of a RED SIGNAL AHEAD WHEN FLASHING active warning sign at SR 141 at Childrens Drive.
 - Yellow and red intervals have been updated to DelDOT's current engineering standards at US 40 at SR 7 and US 113 at SR 18/SR 404 (implementation pending) to alleviate left-turn crash problems at those locations.
- Steve stated that all candidate sites had yellow and red intervals reviewed and timesheet packages were submitted to Jim for implementation. The most significant yellow change interval adjustments to candidate sites were 2.0-second increases to left turns and 1.0-second increases to through movements. This was expected based on DelDOT's updated signal timing standards.
- Matt stated that Xerox performed video monitoring at candidate intersections to obtain violation data and that he conducted constructability assessments with Xerox. Only two approaches will not meet constructability requirements – westbound Kenmar Drive at SR 72 and the eastbound driveway at Summit Village Shopping Center at US 301/SR 896.

- WRA presented summarized violation data at the candidate intersections including a summary of the crashes by at-fault approach. The approach with the highest at-fault crash total shall be monitored, and the group discussed which other approaches should be monitored based on at-fault crash history and the recorded violations. The sites are presented below, with the highest at-fault approach in parentheses.

- **Rank 1 – US 13 at Memorial Drive / Hazeldell Avenue (NB)**
 - The group agreed to monitor the northbound and southbound approaches.
- **Rank 2 – US 40 at Glasgow Drive (WB)**
 - The group agreed to monitor the westbound and eastbound approaches.
- **Rank 4 – SR 72 (S. Chapel Street) at Kenmar Drive / Pencader Plaza (SB)**
 - The group agreed to monitor the southbound and northbound approaches.
- **Rank 5 – US 13 at Boulden Boulevard / Bacon Avenue (SB)**
 - The group agreed to monitor all four approaches.
- **Rank 6 – SR 273 (Christiana Road) at SR 1 SB ramps (EB)**
 - Mark asked if the interchange project was moving ahead; Adam responded that it was not.
 - Adam questioned why the violations for the SB approach were relatively high and suggested checking the Xerox data to ensure they were not also counting right turns as violations.
 - The group agreed to monitor the eastbound approach.
 - *After the meeting, Xerox data was reviewed and it was confirmed that only left-turning traffic on the southbound approach contributed to the violation totals. Violations typically occurred during the PM peak period.*
- **Rank 7 – US 40 at Eden Square (EB)**
 - Jim noted that the TMC was actively reviewing phasing and overlap operations at this signal since the Eden Square Lowe's has relocated.
 - Mark stated that pedestrian crossings will be installed at US 40 at SR 7; Jim stated that due to cabinet requirements, the Eden Square signal will need to operate separately from the SR 7 signal after pedestrian signals are installed.
 - The group agreed to monitor the eastbound and westbound approaches.
- **Rank 8 – SR 58 (Churchmans Road) at I-95 / SR 1 SB / SR 7 SB ramps (EB)**
 - Mark questioned who would be financially responsible for moving camera equipment if the upcoming intersection project required relocation; Matt stated he would check the ERLSP Business Rules.
 - The group agreed to monitor all three approaches.
 - *After the meeting, contract documents were reviewed, and in the Request for Proposals (an addendum to DelDOT Agreement #1671) it is stated that "The Vendor will be responsible for relocating the red light monitoring equipment at the Vendor's expense in advance of an approved Department project."*
- **Rank 9 – SR 4 at Salem Church Road / SR 273 Connector (EB)**
 - The group agreed to monitor all four approaches.
- **Rank 11 – SR 58 (Churchmans Road) at I-95 SB off-ramp (WB)**
 - The group agreed to monitor the westbound and eastbound approaches.
- **Rank 16 – US 202 at Silverside Road (NB)**
 - The group agreed to monitor the northbound and southbound approaches.



- **Rank 20 – US 301 / SR 896 (Summit Bridge Road) at Summit Village Shopping Centre / Shoppes of Mt. Pleasant (SB)**
 - The group agreed to monitor the southbound and northbound approaches.
- **Rank 21 – SR 1 at US 9 (SB and EB)**
 - Mark, Adam, and Matt agreed that Xerox's installation of camera equipment should occur after the SR 1 Pedestrian Improvements project is complete.
 - The group agreed to monitor all four approaches.
- **Rank 22 – SR 141 (Centre Road) at SR 34 (Faulkland Road) (NB)**
 - The group agreed to monitor all four approaches.
- **Rank 23 – SR 141 (Powder Mill Road) at W. Park Drive / US 202 SB off-ramp (EB)**
 - The group agreed to monitor the eastbound, westbound and southbound approaches.
- **Rank 25 – SR 4 at SR 72 (S. Chapel Street) (SB)**
 - Tom noted that downstream southbound traffic occasionally backs up from SR 72 at Kenmar Drive to the signal at SR 4. Matt asked if changing the cycle lengths or coordinated zone assignments may alleviate the congestion. Jim stated the TMC has updated timings relatively recently and is satisfied with current operations. Tom confirmed that the signals accommodate the peak traffic better now than in the past.
 - The group agreed to monitor all four approaches.
- **Rank 26 – US 40 at Governors Square (WB)**
 - The group agreed to monitor the eastbound and westbound approaches.

The group also discussed additional monitoring at six of the existing 30 DeIDOT red light camera sites that met similar at-fault crash total requirements as candidate sites. Xerox provided violation data at the requested unmonitored approaches.

- **Rank 1 – US 40 at Scotland Drive**
 - The group agreed to add monitoring to the westbound approach (eastbound currently monitored).
- **Rank 2 – SR 58 (Churchmans Road) at SR 7 NB ramps / Geoffrey Drive**
 - The group agreed to add monitoring to the eastbound approach (westbound currently monitored).
- **Rank 3 – US 40 at SR 896**
 - The group agreed to add monitoring to the remaining three approaches (westbound currently monitored).
- **Rank 4 – US 13 at Roosevelt Avenue (NCC)**
 - The group agreed to add monitoring to the southbound approach (northbound currently monitored).
- **Rank 5 – US 113 at SR 20 (Hardscrabble Road) / Betts Pond Road**
 - The group agreed to add monitoring to the northbound approach (southbound currently monitored).
- **Rank 28 – SR 2 at SR 100 (Dupont Road)**
 - At the August meeting, the group had agreed to perform a video validation at this intersection in order to confirm whether additional approaches should be monitored. No significant violation trends were observed.
 - The group agreed not to add additional monitoring (eastbound currently monitored).



- Denny asked if Xerox responded directly to Miss Utility tickets. Matt responded that he thought they had to but would check into it – *After the meeting, the Business Rules were reviewed and one of the rules states that “Xerox will register with Miss Utility of Delaware and respond to infrastructure locate requests.”*
- Adam requested that WRA provide a draft report on the selection process for ERLSP, including meeting minutes and the “master” list of signals ranked by red-light-running crashes.
- Dana presented a draft revision to the site selection process document presently available on DeIDOT’s ERLSP website. The group reviewed the draft and suggested minor edits.
- At the group’s request, WRA agreed to prepare a summary list for Nicole Majeski containing each selected site’s intersection name, approaches to be monitored, area legislators, and the final site selection process document.
- Adam asked if the ERLSP Annual Report should include a list of the new selected sites. Dana stated it is typically submitted in February, so an official list would not be in this year’s report, only a brief description of the ongoing site selection efforts.
- The group established a goal of the end of calendar year 2016 for all newly monitored sites to be operational – *After the meeting, Matt confirmed this goal with Xerox.*

The above is a memorandum of understanding between the parties regarding the topics discussed and the decisions reached. Any participants desiring to add to, or otherwise amend the minutes, are requested to put their comments in writing to the writer within seven (7) days; otherwise, the minutes will stand as written.



Steve Harr, PE, PTOE



APPENDIX

I



**2015 Electronic Red Light Safety Program
Recommended Monitored Approaches - State Legislators
January 20, 2016**

Statewide Rank	Major Intersecting Road	Minor Intersecting Road	County	Legislative Representation & District		Proposed Monitored Approaches
				Senate	House	
1	US 13	Memorial Dr / Hazeldell Ave	New Castle	Henry (District 2) McBride (District 13)	Johnson (District 16)	NB, SB
2	US 40	Glasgow Dr	New Castle	Townsend (District 11) McBride (District 13)	Viola (District 26) Longhurst (District 15)	EB, WB
4	SR 72 (S Chapel St)	Kenmar Dr / Pencader Plaza	New Castle	Hall-Long (District 10) Townsend (District 11)	Kowalko (District 25) Osienki (District 24)	NB, SB
5	US 13	Boulden Blvd / Bacon Ave	New Castle	Henry (District 2) McBride (District 13) Poore (District 12)	Johnson (District 16) Mulrooney (District 17)	NB, SB, EB, WB
6	SR 273 (Christiana Rd)	SR 1 SB ramps	New Castle	McBride (District 13)	Bentz (District 18)	EB
7	US 40	Eden Square	New Castle	McBride (District 13)	Bentz (District 18) Smith (District 5)	EB, WB
8	SR 58 (Churchmans Rd)	I-95 / SR 1 SB / SR 7 SB ramps	New Castle	Peterson (District 9)	Mulrooney (District 17) Bentz (District 18)	EB, WB, SB
9	SR 4	Salem Church Rd / SR 273 Connector	New Castle	Peterson (District 9) Townsend (District 11)	Osienki (District 24)	EB, WB, NB, SB
11	SR 58 (Churchmans Rd)	I-95 SB off-ramp	New Castle	Peterson (District 9)	Bentz (District 18) Mulrooney (District 17)	EB, WB
16	US 202	Silverside Rd	New Castle	Lavelle (District 4) Cloutier (District 5)	Hudson (District 12) Matthews (District 10)	NB, SB
20	US 301 / SR 896 (Summit Bridge Rd)	Summit Village Shopping Centre / Shoppes of Mt. Pleasant	New Castle	Hall-Long (District 10)	Hensley (District 9)	NB, SB
21	SR 1 [Assumed to run in North/South direction]	US 9	Sussex	Lopez (District 6)	Schwartzkopf (District 14) Smyk (District 20)	NB, SB, EB, WB
22	SR 141 (Centre Rd)	SR 34 (Faulkland Rd)	New Castle	Blevins (District 7)	Brady (District 4) Mitchell (District 13)	NB, SB, EB, WB
23	SR 141 (Powder Mill Rd) [Assumed to run in East/West direction]	W Park Dr / US 202 SB off-ramp	New Castle	Lavelle (District 4)	Brady (District 4)	EB, WB, SB
25	SR 4	SR 72 (S Chapel St)	New Castle	Hall-Long (District 10) Townsend (District 11) Sokola (District 8)	Kowalko (District 25) Osienki (District 24)	EB, WB, NB, SB
26	US 40	Governors Square	New Castle	McBride (District 13)	Smith (District 5)	EB, WB

Existing 1	US 40	Scotland Dr	New Castle	Poore (District 12)	Longhurst (District 15)	WB EB (existing)
Existing 2	SR 58 (Churchmans Rd)	SR 7 NB ramps / Geoffrey Dr	New Castle	Peterson (District 9)	Mulrooney (District 17) Bentz (District 18)	EB WB (existing)
Existing 3	US 40	SR 896	New Castle	Hall-Long (District 10) Poore (District 12)	Jaques (District 27)	EB, NB, SB WB (existing)
Existing 4	US 13	Roosevelt Ave	New Castle	Poore (District 12) McBride (District 13)	Mulrooney (District 17)	SB NB (existing)
Existing 5	US 113	SR 20 (Hardscrabble Rd) / Betts Pond Rd	Sussex	Hocker (District 20)	Collins (District 41)	NB SB (existing)

Summary

- 51 approaches presently monitored at 30 intersections
- 7 additional approaches recommended for monitoring at the 30 existing sites
- 43 approaches recommended for monitoring at an additional 16 intersections
- No new or additional municipal approaches based on the 2015 site selection process

APPENDIX

J

Electronic Red Light Safety Program

Intersection Selection Process

January 26, 2016

Initial Screening

- 1) Intersections are first ranked (highest to lowest) by the total number of red-light running crashes by approach using the most recent five years of available crash data. Summary crash data is used (i.e., individual police reports are not reviewed during this step). This includes existing ERLSP intersections with approaches that are not currently monitored.
- 2) The following intersections are eliminated from further consideration during the current selection process:
 - a) Locations that were eliminated from consideration in prior years due to site constraints (see Step 5 below)
 - b) Locations where remedial improvements were installed during or after the crash study period that would reduce the potential for red-light running crashes (e.g., signal reconstruction or intersection improvements project)
- 3) Cameras are installed on an intersection approach; therefore, the top-ranked intersections (typically intersections with 5 or more red-light running crashes during the study period) identified in Steps 1 and 2 are then re-ranked (highest to lowest) by the highest number of “at-fault” crashes by approach based on a review of police reports.
- 4) The top-ranked intersections are evaluated to determine whether other types of engineering solutions could address the red-light running crashes.
 - a) If the engineering solutions can be implemented in a relatively short time period, they are implemented based on availability of funding and the intersection is eliminated from consideration during the current selection process.
 - b) If DeIDOT Traffic determines that the solutions cannot be implemented in a timely manner or may require a capital project, the intersection in question may still be considered for red light camera installation.
 - c) For all intersections under consideration, required yellow change and red clearance interval times are calculated and updated based on DeIDOT’s revised engineering practices which went into effect as of February 25, 2015 (*Traffic Design Manual - 2015 Edition* http://www.deldot.gov/information/pubs_forms/manuals/traffic_design/index.shtml).
- 5) Site visits are performed to determine whether it is feasible to install and operate ERLSP equipment at the remaining candidate intersections. Factors considered include:
 - a) Compatibility with site conditions/infrastructure

- b) Availability of right-of-way for ERLSP equipment
- c) Availability of clear lines of sight for camera perspectives
- d) Confirmation that no road construction or intersection upgrades that would disrupt the camera system are planned at the intersection in the near future

Final Screening

- 6) Actual violation data is collected (by the vendor) for the top intersections identified in the initial screening (Steps 1 – 5).
- 7) The violation data is reviewed by DeIDOT and compared to each intersection's red-light running crash data and a determination is made as to which approaches should be monitored based on the following:
 - a) The approach with the highest number of crashes by at-fault approach shall be monitored
 - b) Other approaches with a high frequency of red-light running crashes
 - c) High frequency of violations
 - d) Complementary movements (i.e., for approaches where the left-turn movement and the through movement share a stop line, both movements may be monitored)
- 8) In accordance with the authorizing legislation, prior to the installation of cameras at new intersections, the incumbent state senator and representative for the districts in which such locations are proposed shall be notified.