

IHCP Exception Preparer Training

Example (Fictitious) Project

Scope of Proposed Work:

- I-65 NB & SB directions
- Widen mainline from 2 lanes to 3 lanes each direction
- Widen bridges over 71st Street
- Widen bridges over water ways
- Deep patching of concrete pavement below HMA surface
- Mill & replace X" surface of HMA
- Place inset pavement markings for lane lines
- Replace overhead sign structures

Closures Required:

- Left and/or right shoulder closures throughout project - widening
- Single lane closures throughout project – deep patching and widening
- Ramp closures at 71st Street – deep patching and HMA overlay
- Narrow lanes (10') – bridge widening
- Rolling slowdowns – pavement marking and sign structure work

SEASONAL ADJUSTMENT FACTORS BY FUNCTIONAL CLASSIFICATION 2011-2015*

2015

Seasonal Adjustment Factors

U1_SWG	Urban - Interstate (1), Principal Arterial (Freeways and Expressways) (2)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	2015	1.158	1.125	1.017	0.965	0.980	0.933	0.940	0.958	0.974	0.949	0.993	1.037
	2014	1.167	1.102	1.044	0.981	0.964	0.958	0.946	0.953	0.977	0.960	1.010	1.021
	2013	1.136	1.079	1.030	0.995	0.958	0.954	0.944	0.934	0.978	0.970	1.005	1.057
	2012	1.155	1.080	1.014	1.002	0.977	0.957	0.972	0.950	1.006	0.985	1.012	1.080
	2011	1.158	1.080	1.001	0.988	0.970	0.940	0.923	0.927	0.975	0.978	1.030	1.054
	5 YR AVG	1.155	1.093	1.021	0.986	0.970	0.948	0.945	0.944	0.982	0.968	1.010	1.050
U2_SWG	Urban - Other Principal Arterials (3), Minor Arterials (4), Collectors (5 & 6), Locals (7)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	2015	1.128	1.076	1.034	0.966	0.968	0.980	0.971	0.955	0.959	0.970	1.036	1.048
	2014	1.112	1.059	1.020	0.973	0.963	0.969	0.975	0.981	0.982	0.973	1.032	1.025
	2013	1.095	1.060	1.052	0.981	0.950	0.976	0.976	0.953	0.970	0.962	1.015	1.066
	2012	1.076	1.012	0.989	0.982	0.971	0.961	0.989	0.981	0.987	0.980	1.020	1.079
	2011	1.104	1.031	0.999	1.002	0.980	0.962	0.976	0.956	0.991	0.979	1.020	1.029
	5 YR AVG	1.103	1.048	1.019	0.981	0.966	0.970	0.977	0.965	0.978	0.973	1.025	1.049
R1_SWGA	Rural - Interstate (1), Principal Arterial (Freeways and Expressways) (2)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	2015	1.232	1.182	1.056	1.000	0.950	0.909	0.888	0.915	0.965	0.954	0.997	1.053
	2014	1.291	1.219	1.066	1.008	0.957	0.906	0.875	0.896	0.989	0.963	1.027	1.056
	2013	1.233	1.182	1.078	1.040	0.961	0.908	0.834	0.889	0.984	0.970	1.019	1.078
	2012	1.212	1.142	1.037	1.008	0.936	0.897	0.892	0.916	1.012	0.983	1.004	1.107
	2011	1.262	1.143	1.045	1.020	0.967	0.905	0.864	0.892	0.987	0.981	0.997	1.077
	5 YR AVG	1.246	1.174	1.056	1.015	0.954	0.905	0.871	0.902	0.987	0.970	1.009	1.074
R2_SWGA	Rural - Principal Arterials (3), Minor Arterials (4)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	2015	1.174	1.119	1.081	0.994	0.958	0.961	0.948	0.930	0.914	0.972	1.055	1.090
	2014	1.219	1.145	1.081	0.988	0.938	0.935	0.940	0.937	0.936	0.946	1.022	1.060
	2013	1.127	1.077	1.059	0.992	0.957	0.968	0.966	0.935	0.948	0.955	1.001	1.062
	2012	1.153	1.070	1.023	0.985	0.949	0.928	0.940	0.943	0.975	0.989	1.018	1.124
	2011	1.153	1.071	1.032	1.008	0.977	0.939	0.958	0.940	0.948	0.947	1.011	1.060
	5 YR AVG	1.165	1.096	1.055	0.993	0.956	0.946	0.950	0.937	0.944	0.962	1.021	1.079
R3_SWGA	Rural - Major Collectors (5), Minor Collectors (6), Locals (7)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	2015	1.138	1.103	1.058	0.965	0.915	0.943	0.961	0.951	0.950	0.963	1.022	1.043
	2014	1.150	1.121	1.077	0.952	0.923	0.954	0.955	0.979	0.958	0.981	1.045	1.074
	2013	1.139	1.106	1.095	0.989	0.922	0.948	0.946	0.928	0.935	0.941	1.001	1.085
	2012	1.166	1.088	1.028	0.983	0.930	0.931	0.954	0.931	0.960	0.973	1.020	1.126
	2011	1.174	1.085	1.043	0.997	0.966	0.918	0.937	0.954	0.993	0.959	1.033	1.098
	5 YR AVG	1.153	1.101	1.060	0.977	0.931	0.939	0.951	0.949	0.959	0.963	1.024	1.085

*The seasonal adjustment factors are used to expand average 24-hour volumes to estimated Annual Average Daily Traffic (AADT).

ANNUAL GROWTH FACTORS BY FUNCTIONAL CLASSIFICATION 2005 - 2015*

U1_SWG	Urban - Interstate (1), Principal Arterial (Freeways and Expressways) (2)										
	YEAR TO	YEAR FROM									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
2005	-	0.983	0.945	0.966	0.948	0.944	0.930	0.922	0.933	0.913	
2006	1.017	-	0.962	0.982	0.964	0.960	0.946	0.937	0.949	0.928	
2007	1.058	1.040	-	1.021	1.002	0.998	0.984	0.975	0.987	0.965	
2008	1.035	1.018	0.979	-	0.981	0.977	0.963	0.954	0.966	0.945	
2009	1.055	1.038	0.998	1.019	-	0.996	0.981	0.973	0.984	0.963	
2010	1.059	1.042	1.002	1.023	1.004	-	0.985	0.976	0.988	0.967	
2011	1.075	1.057	1.017	1.038	1.019	1.015	-	0.991	1.003	0.982	
2012	1.085	1.067	1.026	1.048	1.028	1.024	1.009	-	1.012	0.990	
2013	1.072	1.054	1.013	1.035	1.016	1.012	0.997	0.988	-	0.978	
2014	1.095	1.077	1.036	1.058	1.038	1.034	1.019	1.010	1.022	-	
2015	1.144	1.125	1.083	1.106	1.085	1.081	1.065	1.055	1.068	1.045	

U2_SWG	Urban - Other Principal Arterials (3), Minor Arterials (4), Collectors (5 & 6), Locals (7)										
	YEAR TO	YEAR FROM									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
2005	-	0.993	1.006	1.038	1.042	1.035	1.017	1.018	1.032	1.022	
2006	1.007	-	1.013	1.046	1.050	1.042	1.024	1.025	1.040	1.029	
2007	0.994	0.987	-	1.032	1.036	1.029	1.011	1.012	1.026	1.016	
2008	0.963	0.956	0.969	-	1.004	0.997	0.979	0.980	0.994	0.984	
2009	0.959	0.953	0.965	0.996	-	0.993	0.975	0.976	0.990	0.981	
2010	0.966	0.959	0.972	1.003	1.007	-	0.982	0.983	0.997	0.987	
2011	0.983	0.977	0.989	1.021	1.025	1.018	-	1.001	1.015	1.005	
2012	0.982	0.976	0.988	1.020	1.024	1.017	0.999	-	1.014	1.004	
2013	0.969	0.962	0.975	1.006	1.010	1.003	0.985	0.986	-	0.990	
2014	0.978	0.971	0.984	1.016	1.020	1.013	0.995	0.996	1.010	-	
2015	1.022	1.015	1.029	1.061	1.066	1.058	1.040	1.041	1.055	1.022	

R1_SWGA	Rural - Interstate (1), Principal Arterial (Freeways and Expressways) (2)										
	YEAR TO	YEAR FROM									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
2005	-	0.992	0.984	1.001	1.010	1.014	1.012	0.992	0.993	0.981	
2006	1.008	-	0.992	1.009	1.018	1.022	1.020	1.000	1.001	0.989	
2007	1.016	1.008	-	1.017	1.027	1.031	1.029	1.008	1.009	0.997	
2008	0.999	0.991	0.983	-	1.009	1.013	1.011	0.991	0.992	0.980	
2009	0.990	0.982	0.974	0.991	-	1.004	1.002	0.982	0.983	0.972	
2010	0.986	0.978	0.970	0.987	0.996	-	0.998	0.978	0.979	0.968	
2011	0.988	0.980	0.972	0.989	0.998	1.002	-	0.980	0.981	0.970	
2012	1.008	1.000	0.992	1.009	1.018	1.022	1.020	-	1.001	0.989	
2013	1.007	0.999	0.991	1.008	1.017	1.021	1.019	0.999	-	0.988	
2014	1.019	1.011	1.003	1.020	1.029	1.033	1.031	1.011	1.012	-	
2015	1.065	1.056	1.048	1.066	1.075	1.079	1.077	1.056	1.058	1.041	

R2_SWGA	Rural - Other Principal Arterials (3), Minor Arterials (4)										
	YEAR TO	YEAR FROM									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
2005	-	0.991	0.991	1.042	1.047	1.051	1.049	1.042	1.010	0.996	
2006	1.009	-	1.000	1.052	1.057	1.060	1.059	1.052	1.019	1.005	
2007	1.009	1.000	-	1.052	1.057	1.060	1.059	1.052	1.019	1.005	
2008	0.960	0.951	0.951	-	1.005	1.008	1.007	1.000	0.969	0.956	
2009	0.955	0.946	0.946	0.995	-	1.003	1.002	0.995	0.964	0.951	
2010	0.952	0.943	0.943	0.992	0.997	-	0.999	0.992	0.961	0.948	
2011	0.953	0.944	0.944	0.993	0.998	1.001	-	0.993	0.962	0.949	
2012	0.960	0.951	0.951	1.000	1.005	1.008	1.007	-	0.969	0.956	
2013	0.990	0.981	0.981	1.032	1.037	1.040	1.039	1.032	-	0.986	
2014	1.004	0.995	0.995	1.046	1.052	1.055	1.054	1.046	1.014	-	
2015	1.049	1.040	1.040	1.093	1.099	1.102	1.101	1.094	1.060	1.019	

R3_SWGA	Rural - Major Collectors (5), Minor Collectors (6), Locals (7)										
	YEAR TO	YEAR FROM									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
2005	-	1.005	0.998	1.067	1.059	1.063	1.059	1.059	1.052	1.041	
2006	0.995	-	0.993	1.062	1.054	1.058	1.054	1.054	1.046	1.036	
2007	1.002	1.007	-	1.070	1.061	1.065	1.061	1.061	1.054	1.043	
2008	0.937	0.942	0.935	-	0.992	0.996	0.992	0.992	0.985	0.975	
2009	0.944	0.949	0.942	1.008	-	1.004	1.000	1.000	0.993	0.983	
2010	0.941	0.945	0.939	1.004	0.996	-	0.996	0.996	0.989	0.979	
2011	0.944	0.949	0.942	1.008	1.000	1.004	-	1.000	0.993	0.983	
2012	0.944	0.949	0.942	1.008	1.000	1.004	1.000	-	0.993	0.983	
2013	0.951	0.956	0.949	1.015	1.007	1.011	1.007	1.007	-	0.990	
2014	0.960	0.965	0.959	1.025	1.017	1.021	1.017	1.017	1.010	-	
2015	1.004	1.009	1.002	1.071	1.063	1.067	1.063	1.063	1.055	1.006	

*Factors in this table are used to adjust previous year AADTs to a more current year for similarly classed roads (e.g. to adjust a 2006 urban interstate AADT to a 2010 equivalent, you would multiply the 2006 AADT by 1.042).



Report for IHCP Queuing Analysis

Prepared by: **Manoj Sutaria**
Prepared for: **Jane Doe**

Position: **Work Zone Safety Engineer**
Position: **Project Manager**

Work Zone Information

Route: I-65
Mile marker: MM 122.92 to MM 129.21
Positive Direction: North

Contract: R-12345
Work Year: 2017
Work Month: AUG
Work Type: Construction
Work Description: Added Travel Lanes

Permanent Speed Limit: 65 mph
Work Zone Speed Limit: 45 mph
Workzone Lane Width: 12 ft

Channelizing Devices: Construction Drums / Barrier Wall

Additional Information: The details of this project were made up for the use in IHCP Exception Request Preparer Training. This is not a real project and these analyses should not be used for any future IHCP Exceptions.

Queuing Formula

$$L = L_0 + \frac{(V - C) * 1 \text{ hr}}{(k * N)}$$

Where:

L= Length of Queue for Specified Hour (mi)
L₀= Length of Queue in the Hour Prior to Specified Hour (mi)
V= Hourly Volume (PCE/hr)
C= Hourly Capacity (PCE/hr)
k= Jam Density (PCE/mi/lane)
N= Number of Storage Lanes Upstream of Restriction (lanes)

Jam Density (k)= 190 PCE/mi/ln
N for SB= 2 ln
N for NB= 2 ln



Traffic Information

Count Information

Count Station Number:	971430
Month, Year of Count:	JUN, 2016
Rural/Urban:	Urban

Factors to Adjust Counts to Annual Value in Current Year

Annual Adj. Factor:	1.01
Monthly Adj. Factor:	0.948

Factors to Project Annual Value in Current Year to Work Month and Year

Annual Adj. Factor:	1.000
Monthly Adj. Factor:	0.944

Assumed Percent Reduction of Traffic Due to Detouring

Southbound

Monday-Thursday:	0%
Friday:	0%
Saturday-Sunday:	0%

Northbound

Monday-Thursday:	0%
Friday:	0%
Saturday-Sunday:	0%



Traffic Volumes

Time	Southbound Volumes (PCE/hr)				Northbound Volumes (PCE/hr)			
	Weekday	Friday	Saturday	Sunday	Weekday	Friday	Saturday	Sunday
Midnight to 1 am	734	792	867	526	434	491	545	600
1 am to 2 am	582	684	710	402	380	415	421	375
2 am to 3 am	554	627	557	324	413	354	376	251
3 am to 4 am	516	518	453	236	428	526	369	233
4 am to 5 am	728	773	596	336	646	781	508	262
5 am to 6 am	1128	1148	785	453	917	903	590	344
6 am to 7 am	1665	1654	824	457	1558	1488	837	471
7 am to 8 am	2411	2397	1013	572	1692	1675	1023	640
8 am to 9 am	2293	2264	1236	767	1740	1787	1178	640
9 am to 10 am	1891	1842	1526	993	1523	1422	1220	798
10 am to 11 am	1806	1971	1748	1233	1635	1771	1628	1354
11 am to Noon	1615	1781	1692	1460	1676	1937	1479	1605
Noon to 1 pm	1861	1968	1911	1771	1736	2120	1573	1852
1 pm to 2 pm	1865	1996	1745	1802	1608	1906	1421	1748
2 pm to 3 pm	1739	1794	1571	1549	1823	2059	1548	2037
3 pm to 4 pm	2249	2194	1849	1764	2030	2309	1683	2208
4 pm to 5 pm	2314	2369	1836	1974	2546	2858	2012	2614
5 pm to 6 pm	2371	2388	1878	2068	2844	3267	2208	3211
6 pm to 7 pm	2137	2248	1780	2015	1972	2084	1417	1930
7 pm to 8 pm	1503	1746	1547	1981	1229	1604	1175	1310
8 pm to 9 pm	1334	1564	1521	2026	1092	1412	1101	1322
9 pm to 10 pm	1018	1173	1033	1301	824	1045	856	1083
10 pm to 11 pm	921	1010	825	886	788	932	916	821
11 pm to Midnight	931	1032	769	1026	588	800	742	601

Note: All Traffic Volumes are in PCEs/hr, see IHCP for definition of for this use.



Summary of Alternatives

Southbound

Alternative 1 (Single lane closure 24/7 (12' lane)):

Fails Criteria i, ii, iii, iv

Alternative 2 (Nighttime during weekdays & weekend):

Fails Criteria i, ii, iii, iv

Northbound

Alternative 1 (Single lane closure 24/7 (12' lane)):

Fails Criteria i, ii, iii, iv

Alternative 2 (Nighttime during weekdays & weekend):

Fails Criteria i, ii, iii, iv

Policy Limits Criteria:

- i) No queues of any length for > 6 continuous hours or 12 hours in a calendar day
- ii) No queues >0.5 mi for > 4 continuous hours
- iii) No queues >1.0 mi for > 2 continuous hours
- iv) No queues >1.5 mi



Alternative 1

Capacities for Southbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	1705	1705	1705	1705	1705	1705	1705
1 am to 2 am	1705	1705	1705	1705	1705	1705	1705
2 am to 3 am	1705	1705	1705	1705	1705	1705	1705
3 am to 4 am	1705	1705	1705	1705	1705	1705	1705
4 am to 5 am	1705	1705	1705	1705	1705	1705	1705
5 am to 6 am	1705	1705	1705	1705	1705	1705	1705
6 am to 7 am	1705	1705	1705	1705	1705	1705	1705
7 am to 8 am	1705	1705	1705	1705	1705	1705	1705
8 am to 9 am	1705	1705	1705	1705	1705	1705	1705
9 am to 10 am	1705	1705	1705	1705	1705	1705	1705
10 am to 11 am	1705	1705	1705	1705	1705	1705	1705
11 am to Noon	1705	1705	1705	1705	1705	1705	1705
Noon to 1 pm	1705	1705	1705	1705	1705	1705	1705
1 pm to 2 pm	1705	1705	1705	1705	1705	1705	1705
2 pm to 3 pm	1705	1705	1705	1705	1705	1705	1705
3 pm to 4 pm	1705	1705	1705	1705	1705	1705	1705
4 pm to 5 pm	1705	1705	1705	1705	1705	1705	1705
5 pm to 6 pm	1705	1705	1705	1705	1705	1705	1705
6 pm to 7 pm	1705	1705	1705	1705	1705	1705	1705
7 pm to 8 pm	1705	1705	1705	1705	1705	1705	1705
8 pm to 9 pm	1705	1705	1705	1705	1705	1705	1705
9 pm to 10 pm	1705	1705	1705	1705	1705	1705	1705
10 pm to 11 pm	1705	1705	1705	1705	1705	1705	1705
11 pm to Midnight	1705	1705	1705	1705	1705	1705	1705

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
Number of Hours per week of restrictions = 168 hr(s)



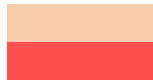
INDIANA DEPARTMENT OF TRANSPORTATION

Alternative 1

Queuing for Southbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.8	0.8	0.8	1.0	5.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	2.4	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	1.9	1.9	1.9	1.9	1.8	0.0	0.0
8 am to 9 am	3.4	3.4	3.4	3.4	3.3	0.0	0.0
9 am to 10 am	3.9	3.9	3.9	3.9	3.7	0.0	0.0
10 am to 11 am	4.2	4.2	4.2	4.2	4.4	0.1	0.0
11 am to Noon	3.9	3.9	3.9	3.9	4.6	0.1	0.0
Noon to 1 pm	4.3	4.3	4.3	4.3	5.2	0.6	0.2
1 pm to 2 pm	4.8	4.8	4.8	4.8	6.0	0.7	0.4
2 pm to 3 pm	4.8	4.8	4.8	4.8	6.2	0.4	0.0
3 pm to 4 pm	6.3	6.3	6.3	6.3	7.5	0.8	0.2
4 pm to 5 pm	7.9	7.9	7.9	7.9	9.3	1.1	0.9
5 pm to 6 pm	9.6	9.6	9.6	9.6	11.1	1.6	1.8
6 pm to 7 pm	10.8	10.8	10.8	10.8	12.5	1.8	2.7
7 pm to 8 pm	10.2	10.2	10.2	10.2	12.6	1.3	3.4
8 pm to 9 pm	9.3	9.3	9.3	9.3	12.2	0.9	4.2
9 pm to 10 pm	7.5	7.5	7.5	7.5	10.8	0.0	3.2
10 pm to 11 pm	5.4	5.4	5.4	5.4	9.0	0.0	1.0
11 pm to Midnight	3.4	3.4	3.4	3.4	7.2	0.0	0.0

Legend:



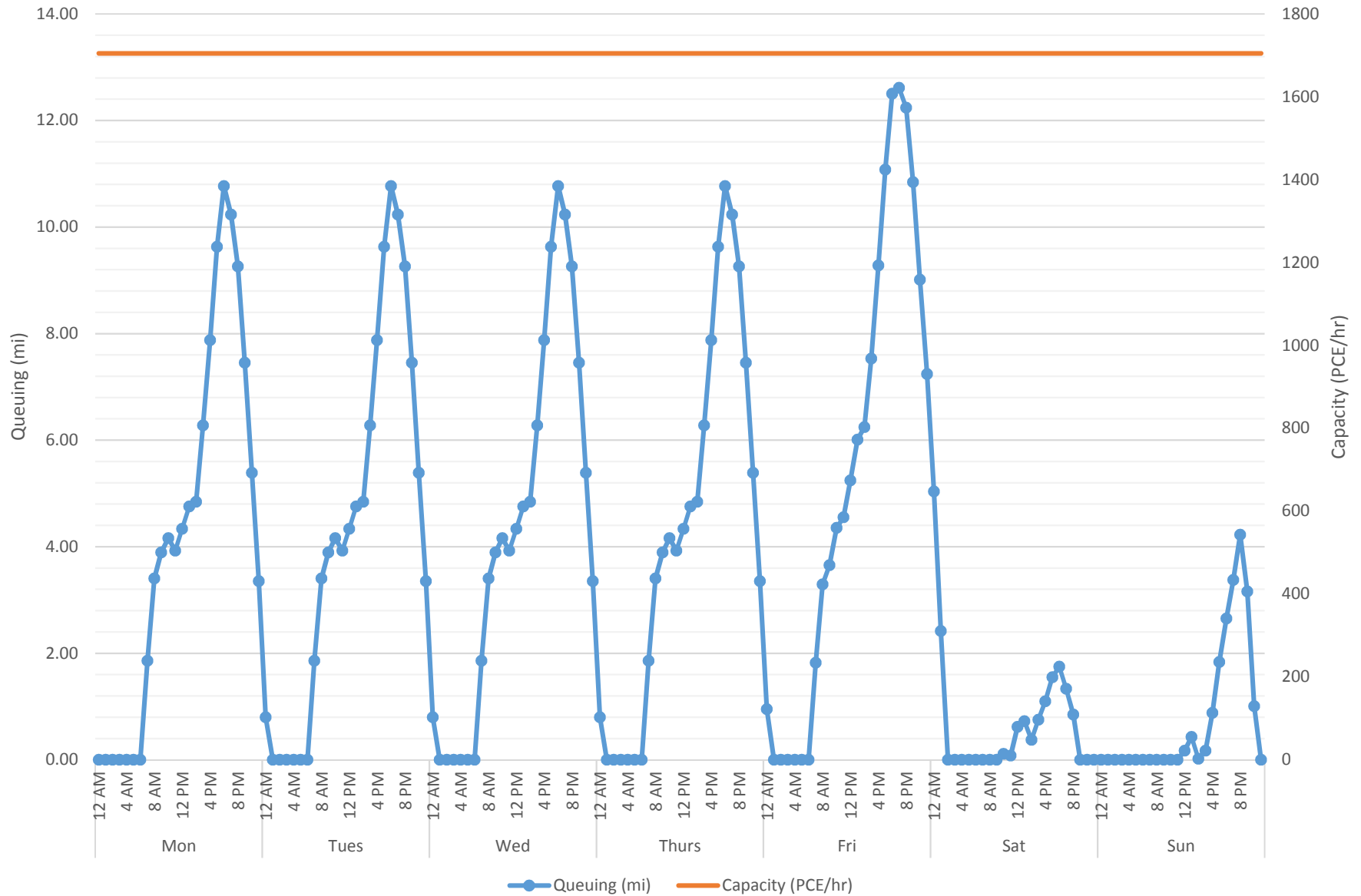
Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 12.6 mi
 Total queue length-hours = 571 mi-hrs
 Total hours with queue = 113 hrs

Anticipated Queuing (mi) for Alternative 1 for Southbound Traffic (Single lane closure 24/7 (12' lane))





Alternative 1

Capacities for Northbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	1705	1705	1705	1705	1705	1705	1705
1 am to 2 am	1705	1705	1705	1705	1705	1705	1705
2 am to 3 am	1705	1705	1705	1705	1705	1705	1705
3 am to 4 am	1705	1705	1705	1705	1705	1705	1705
4 am to 5 am	1705	1705	1705	1705	1705	1705	1705
5 am to 6 am	1705	1705	1705	1705	1705	1705	1705
6 am to 7 am	1705	1705	1705	1705	1705	1705	1705
7 am to 8 am	1705	1705	1705	1705	1705	1705	1705
8 am to 9 am	1705	1705	1705	1705	1705	1705	1705
9 am to 10 am	1705	1705	1705	1705	1705	1705	1705
10 am to 11 am	1705	1705	1705	1705	1705	1705	1705
11 am to Noon	1705	1705	1705	1705	1705	1705	1705
Noon to 1 pm	1705	1705	1705	1705	1705	1705	1705
1 pm to 2 pm	1705	1705	1705	1705	1705	1705	1705
2 pm to 3 pm	1705	1705	1705	1705	1705	1705	1705
3 pm to 4 pm	1705	1705	1705	1705	1705	1705	1705
4 pm to 5 pm	1705	1705	1705	1705	1705	1705	1705
5 pm to 6 pm	1705	1705	1705	1705	1705	1705	1705
6 pm to 7 pm	1705	1705	1705	1705	1705	1705	1705
7 pm to 8 pm	1705	1705	1705	1705	1705	1705	1705
8 pm to 9 pm	1705	1705	1705	1705	1705	1705	1705
9 pm to 10 pm	1705	1705	1705	1705	1705	1705	1705
10 pm to 11 pm	1705	1705	1705	1705	1705	1705	1705
11 pm to Midnight	1705	1705	1705	1705	1705	1705	1705

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
Number of Hours per week of restrictions = 168 hr(s)



INDIANA DEPARTMENT OF TRANSPORTATION

Alternative 1

Queuing for Northbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	2.8	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.1	0.1	0.1	0.1	0.2	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.2	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Noon to 1 pm	0.1	0.1	0.1	0.1	1.9	0.0	0.4
1 pm to 2 pm	0.0	0.0	0.0	0.0	2.4	0.0	0.5
2 pm to 3 pm	0.3	0.3	0.3	0.3	3.3	0.0	1.4
3 pm to 4 pm	1.2	1.2	1.2	1.2	4.9	0.0	2.7
4 pm to 5 pm	3.4	3.4	3.4	3.4	8.0	0.8	5.1
5 pm to 6 pm	6.4	6.4	6.4	6.4	12.1	2.1	9.1
6 pm to 7 pm	7.1	7.1	7.1	7.1	13.1	1.4	9.6
7 pm to 8 pm	5.8	5.8	5.8	5.8	12.8	0.0	8.6
8 pm to 9 pm	4.2	4.2	4.2	4.2	12.0	0.0	7.6
9 pm to 10 pm	1.9	1.9	1.9	1.9	10.3	0.0	6.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	8.3	0.0	3.6
11 pm to Midnight	0.0	0.0	0.0	0.0	5.9	0.0	0.7

Legend:



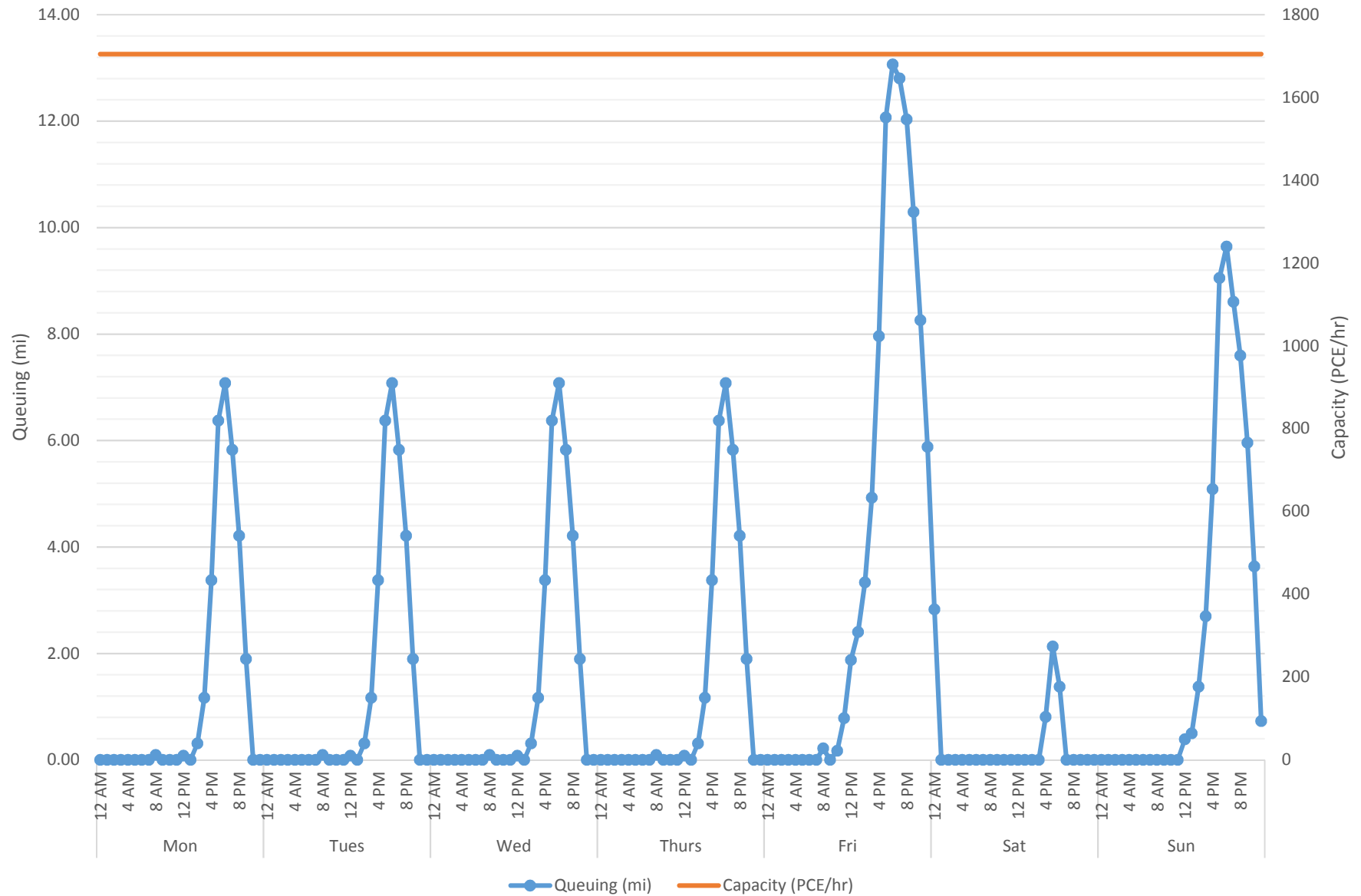
Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 13.1 mi
 Total queue length-hours = 280 mi-hrs
 Total hours with queue = 71 hrs

Anticipated Queuing (mi) for Alternative 1 for Northbound Traffic (Single lane closure 24/7 (12' lane))





Alternative 2

Capacities for Southbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	1705	1705	1705	1705	1705	1705	1705
1 am to 2 am	1705	1705	1705	1705	1705	1705	1705
2 am to 3 am	1705	1705	1705	1705	1705	1705	1705
3 am to 4 am	1705	1705	1705	1705	1705	1705	1705
4 am to 5 am	1705	1705	1705	1705	1705	1705	1705
5 am to 6 am	1705	1705	1705	1705	1705	1705	1705
6 am to 7 am	5170	5170	5170	5170	5170	1705	1705
7 am to 8 am	5170	5170	5170	5170	5170	1705	1705
8 am to 9 am	5170	5170	5170	5170	5170	1705	1705
9 am to 10 am	5170	5170	5170	5170	5170	1705	1705
10 am to 11 am	5170	5170	5170	5170	5170	1705	1705
11 am to Noon	5170	5170	5170	5170	5170	1705	1705
Noon to 1 pm	5170	5170	5170	5170	5170	1705	1705
1 pm to 2 pm	5170	5170	5170	5170	5170	1705	1705
2 pm to 3 pm	5170	5170	5170	5170	5170	1705	1705
3 pm to 4 pm	5170	5170	5170	5170	5170	1705	1705
4 pm to 5 pm	5170	5170	5170	5170	5170	1705	1705
5 pm to 6 pm	5170	5170	5170	5170	5170	1705	1705
6 pm to 7 pm	5170	5170	5170	5170	5170	1705	1705
7 pm to 8 pm	5170	5170	5170	5170	5170	1705	1705
8 pm to 9 pm	5170	5170	5170	5170	5170	1705	1705
9 pm to 10 pm	1705	1705	1705	1705	1705	1705	1705
10 pm to 11 pm	1705	1705	1705	1705	1705	1705	1705
11 pm to Midnight	1705	1705	1705	1705	1705	1705	1705

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
 Number of Hours per week of restrictions = 93 hr(s)

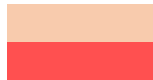


Alternative 2

Queuing for Southbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.1	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.6	0.2
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.7	0.4
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.4	0.0
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.8	0.2
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	1.1	0.9
5 pm to 6 pm	0.0	0.0	0.0	0.0	0.0	1.6	1.8
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	1.8	2.7
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	1.3	3.4
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.9	4.2
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	3.2
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	1.0
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend:



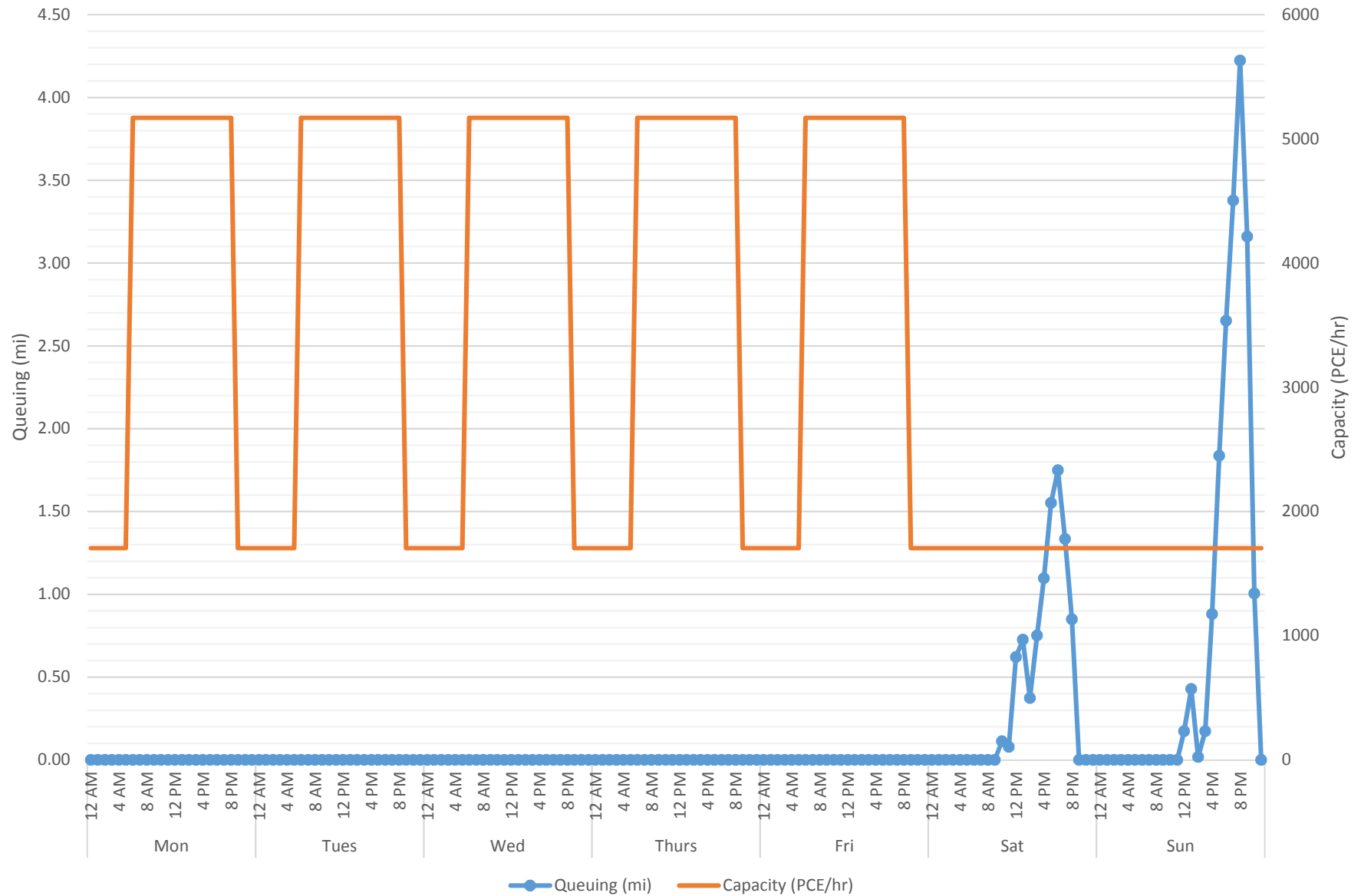
Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 4.2 mi
Total queue length-hours = 27 mi-hrs
Total hours with queue = 22 hrs

Anticipated Queuing (mi) for Alternative 2 for Southbound Traffic (Nighttime during weekdays & weekend)





Alternative 2

Capacities for Northbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	1705	1705	1705	1705	1705	1705	1705
1 am to 2 am	1705	1705	1705	1705	1705	1705	1705
2 am to 3 am	1705	1705	1705	1705	1705	1705	1705
3 am to 4 am	1705	1705	1705	1705	1705	1705	1705
4 am to 5 am	1705	1705	1705	1705	1705	1705	1705
5 am to 6 am	1705	1705	1705	1705	1705	1705	1705
6 am to 7 am	5170	5170	5170	5170	5170	1705	1705
7 am to 8 am	5170	5170	5170	5170	5170	1705	1705
8 am to 9 am	5170	5170	5170	5170	5170	1705	1705
9 am to 10 am	5170	5170	5170	5170	5170	1705	1705
10 am to 11 am	5170	5170	5170	5170	5170	1705	1705
11 am to Noon	5170	5170	5170	5170	5170	1705	1705
Noon to 1 pm	5170	5170	5170	5170	5170	1705	1705
1 pm to 2 pm	5170	5170	5170	5170	5170	1705	1705
2 pm to 3 pm	5170	5170	5170	5170	5170	1705	1705
3 pm to 4 pm	5170	5170	5170	5170	5170	1705	1705
4 pm to 5 pm	5170	5170	5170	5170	5170	1705	1705
5 pm to 6 pm	5170	5170	5170	5170	5170	1705	1705
6 pm to 7 pm	5170	5170	5170	5170	5170	1705	1705
7 pm to 8 pm	5170	5170	5170	5170	5170	1705	1705
8 pm to 9 pm	5170	5170	5170	5170	5170	1705	1705
9 pm to 10 pm	1705	1705	1705	1705	1705	1705	1705
10 pm to 11 pm	1705	1705	1705	1705	1705	1705	1705
11 pm to Midnight	1705	1705	1705	1705	1705	1705	1705

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
 Number of Hours per week of restrictions = 93 hr(s)

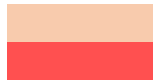


Alternative 2

Queuing for Northbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.4
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.5
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.0	1.4
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.0	2.7
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	0.8	5.1
5 pm to 6 pm	0.0	0.0	0.0	0.0	0.0	2.1	9.1
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	1.4	9.6
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	0.0	8.6
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.0	7.6
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	6.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	3.6
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.7

Legend:



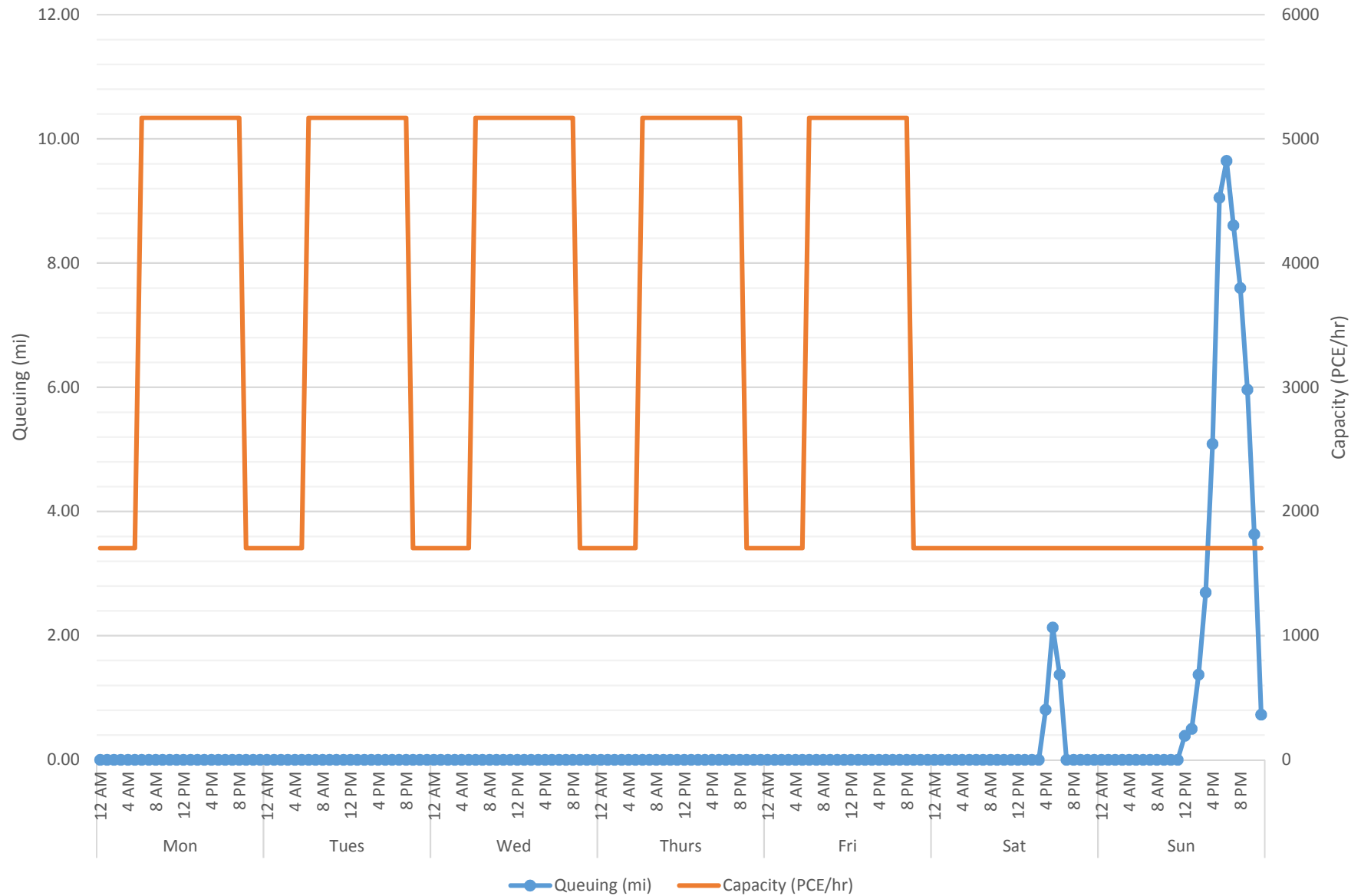
Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 9.6 mi
 Total queue length-hours = 60 mi-hrs
 Total hours with queue = 15 hrs

Anticipated Queuing (mi) for Alternative 2 for Northbound Traffic (Nighttime during weekdays & weekend)





Report for IHCP Queuing Analysis

Prepared by: **Manoj Sutaria**
Prepared for: **Jane Doe**

Position: **Work Zone Safety Engineer**
Position: **Project Manager**

Work Zone Information

Route: I-65
Mile marker: MM 122.92 to MM 129.21
Positive Direction: North

Contract: R-12345
Work Year: 2017
Work Month: AUG
Work Type: Construction
Work Description: Added travel Lanes

Permanent Speed Limit: 65 mph
Work Zone Speed Limit: 45 mph
Workzone Lane Width: 10 ft

Channelizing Devices: Construction Drums / Barrier Wall

Additional Information: The details of this project were made up for the use in IHCP Exception Request Preparer training. This is not a real project and these analyses should not be used for any future IHCP Exceptions.

Queuing Formula

$$L = L_0 + \frac{(V - C) * 1 \text{ hr}}{(k * N)}$$

Where:

L= Length of Queue for Specified Hour (mi)
L₀= Length of Queue in the Hour Prior to Specified Hour (mi)
V= Hourly Volume (PCE/hr)
C= Hourly Capacity (PCE/hr)
k= Jam Density (PCE/mi/lane)
N= Number of Storage Lanes Upstream of Restriction (lanes)

Jam Density (k)= 190 PCE/mi/ln
N for SB= 2 ln
N for NB= 2 ln



Traffic Information

Count Information

Count Station Number:	971430
Month, Year of Count:	JUN, 2016
Rural/Urban:	Urban

Factors to Adjust Counts to Annual Value in Current Year

Annual Adj. Factor:	1.01
Monthly Adj. Factor:	0.948

Factors to Project Annual Value in Current Year to Work Month and Year

Annual Adj. Factor:	1.000
Monthly Adj. Factor:	0.944

Assumed Percent Reduction of Traffic Due to Detouring

Southbound

Monday-Thursday:	0%
Friday:	0%
Saturday-Sunday:	0%

Northbound

Monday-Thursday:	0%
Friday:	0%
Saturday-Sunday:	0%



Traffic Volumes

Time	Southbound Volumes (PCE/hr)				Northbound Volumes (PCE/hr)			
	Weekday	Friday	Saturday	Sunday	Weekday	Friday	Saturday	Sunday
Midnight to 1 am	734	792	867	526	434	491	545	600
1 am to 2 am	582	684	710	402	380	415	421	375
2 am to 3 am	554	627	557	324	413	354	376	251
3 am to 4 am	516	518	453	236	428	526	369	233
4 am to 5 am	728	773	596	336	646	781	508	262
5 am to 6 am	1128	1148	785	453	917	903	590	344
6 am to 7 am	1665	1654	824	457	1558	1488	837	471
7 am to 8 am	2411	2397	1013	572	1692	1675	1023	640
8 am to 9 am	2293	2264	1236	767	1740	1787	1178	640
9 am to 10 am	1891	1842	1526	993	1523	1422	1220	798
10 am to 11 am	1806	1971	1748	1233	1635	1771	1628	1354
11 am to Noon	1615	1781	1692	1460	1676	1937	1479	1605
Noon to 1 pm	1861	1968	1911	1771	1736	2120	1573	1852
1 pm to 2 pm	1865	1996	1745	1802	1608	1906	1421	1748
2 pm to 3 pm	1739	1794	1571	1549	1823	2059	1548	2037
3 pm to 4 pm	2249	2194	1849	1764	2030	2309	1683	2208
4 pm to 5 pm	2314	2369	1836	1974	2546	2858	2012	2614
5 pm to 6 pm	2371	2388	1878	2068	2844	3267	2208	3211
6 pm to 7 pm	2137	2248	1780	2015	1972	2084	1417	1930
7 pm to 8 pm	1503	1746	1547	1981	1229	1604	1175	1310
8 pm to 9 pm	1334	1564	1521	2026	1092	1412	1101	1322
9 pm to 10 pm	1018	1173	1033	1301	824	1045	856	1083
10 pm to 11 pm	921	1010	825	886	788	932	916	821
11 pm to Midnight	931	1032	769	1026	588	800	742	601

Note: All Traffic Volumes are in PCEs/hr, see IHCP for definition of for this use.



Summary of Alternatives

Southbound

Alternative 1 (2, 10' lane, No Work Restriction):
Alternative 2 (2, 10' lane, No urban 10% factor):
Alternative 3 (Single Shoulder Closure):

Within Policy Limits
Within Policy Limits
Within Policy Limits

Northbound

Alternative 1 (2, 10' lane, No Work Restriction):
Alternative 2 (2, 10' lane, No urban 10% factor):
Alternative 3 (Single Shoulder Closure):

Within Policy Limits
Within Policy Limits
Within Policy Limits

Policy Limits Criteria:

- i) No queues of any length for > 6 continuous hours or 12 hours in a calendar day
- ii) No queues >0.5 mi for > 4 continuous hours
- iii) No queues >1.0 mi for > 2 continuous hours
- iv) No queues >1.5 mi



Alternative 1

Capacities for Southbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	3135	3135	3135	3135	3135	3135	3135
1 am to 2 am	3135	3135	3135	3135	3135	3135	3135
2 am to 3 am	3135	3135	3135	3135	3135	3135	3135
3 am to 4 am	3135	3135	3135	3135	3135	3135	3135
4 am to 5 am	3135	3135	3135	3135	3135	3135	3135
5 am to 6 am	3135	3135	3135	3135	3135	3135	3135
6 am to 7 am	3135	3135	3135	3135	3135	3135	3135
7 am to 8 am	3135	3135	3135	3135	3135	3135	3135
8 am to 9 am	3135	3135	3135	3135	3135	3135	3135
9 am to 10 am	3135	3135	3135	3135	3135	3135	3135
10 am to 11 am	3135	3135	3135	3135	3135	3135	3135
11 am to Noon	3135	3135	3135	3135	3135	3135	3135
Noon to 1 pm	3135	3135	3135	3135	3135	3135	3135
1 pm to 2 pm	3135	3135	3135	3135	3135	3135	3135
2 pm to 3 pm	3135	3135	3135	3135	3135	3135	3135
3 pm to 4 pm	3135	3135	3135	3135	3135	3135	3135
4 pm to 5 pm	3135	3135	3135	3135	3135	3135	3135
5 pm to 6 pm	3135	3135	3135	3135	3135	3135	3135
6 pm to 7 pm	3135	3135	3135	3135	3135	3135	3135
7 pm to 8 pm	3135	3135	3135	3135	3135	3135	3135
8 pm to 9 pm	3135	3135	3135	3135	3135	3135	3135
9 pm to 10 pm	3135	3135	3135	3135	3135	3135	3135
10 pm to 11 pm	3135	3135	3135	3135	3135	3135	3135
11 pm to Midnight	3135	3135	3135	3135	3135	3135	3135

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
Number of Hours per week of restrictions = 168 hr(s)

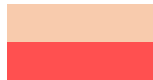


Alternative 1

Queuing for Southbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 pm to 6 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend:



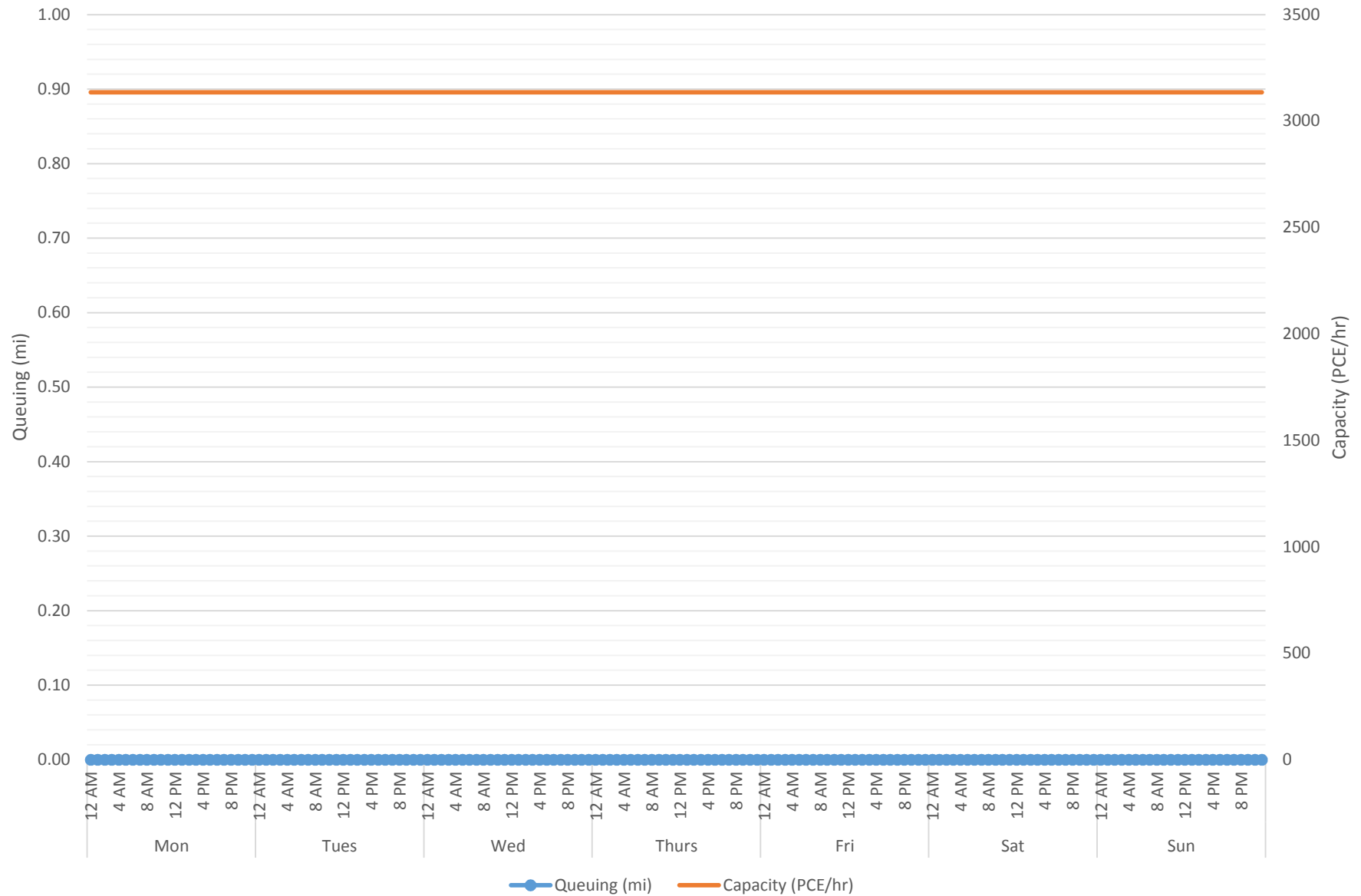
Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 0.0 mi
 Total queue length-hours = 0 mi-hrs
 Total hours with queue = 0 hrs

Anticipated Queuing (mi) for Alternative 1 for Southbound Traffic (2, 10' lane, No Work Restriction)





Alternative 1

Capacities for Northbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	3135	3135	3135	3135	3135	3135	3135
1 am to 2 am	3135	3135	3135	3135	3135	3135	3135
2 am to 3 am	3135	3135	3135	3135	3135	3135	3135
3 am to 4 am	3135	3135	3135	3135	3135	3135	3135
4 am to 5 am	3135	3135	3135	3135	3135	3135	3135
5 am to 6 am	3135	3135	3135	3135	3135	3135	3135
6 am to 7 am	3135	3135	3135	3135	3135	3135	3135
7 am to 8 am	3135	3135	3135	3135	3135	3135	3135
8 am to 9 am	3135	3135	3135	3135	3135	3135	3135
9 am to 10 am	3135	3135	3135	3135	3135	3135	3135
10 am to 11 am	3135	3135	3135	3135	3135	3135	3135
11 am to Noon	3135	3135	3135	3135	3135	3135	3135
Noon to 1 pm	3135	3135	3135	3135	3135	3135	3135
1 pm to 2 pm	3135	3135	3135	3135	3135	3135	3135
2 pm to 3 pm	3135	3135	3135	3135	3135	3135	3135
3 pm to 4 pm	3135	3135	3135	3135	3135	3135	3135
4 pm to 5 pm	3135	3135	3135	3135	3135	3135	3135
5 pm to 6 pm	3135	3135	3135	3135	3135	3135	3135
6 pm to 7 pm	3135	3135	3135	3135	3135	3135	3135
7 pm to 8 pm	3135	3135	3135	3135	3135	3135	3135
8 pm to 9 pm	3135	3135	3135	3135	3135	3135	3135
9 pm to 10 pm	3135	3135	3135	3135	3135	3135	3135
10 pm to 11 pm	3135	3135	3135	3135	3135	3135	3135
11 pm to Midnight	3135	3135	3135	3135	3135	3135	3135

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
 Number of Hours per week of restrictions = 168 hr(s)



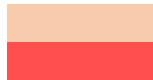
INDIANA DEPARTMENT OF TRANSPORTATION

Alternative 1

Queuing for Northbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 pm to 6 pm	0.0	0.0	0.0	0.0	0.3	0.0	0.2
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend:



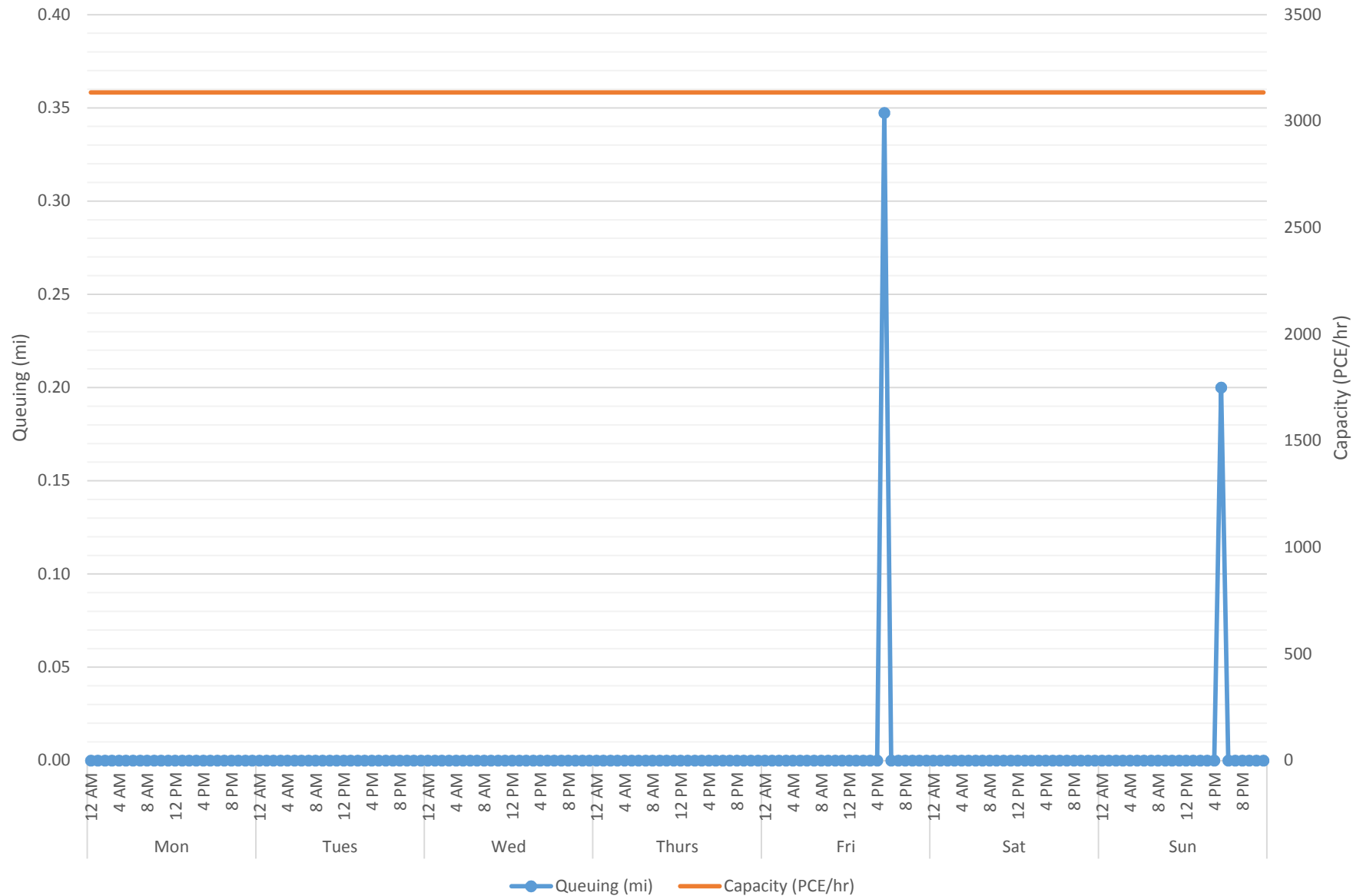
Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 0.3 mi
 Total queue length-hours = 1 mi-hrs
 Total hours with queue = 2 hrs

Anticipated Queuing (mi) for Alternative 1 for Northbound Traffic (2, 10' lane, No Work Restriction)





INDIANA DEPARTMENT OF TRANSPORTATION

Alternative 2

Capacities for Southbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	2850	2850	2850	2850	2850	2850	2850
1 am to 2 am	2850	2850	2850	2850	2850	2850	2850
2 am to 3 am	2850	2850	2850	2850	2850	2850	2850
3 am to 4 am	2850	2850	2850	2850	2850	2850	2850
4 am to 5 am	2850	2850	2850	2850	2850	2850	2850
5 am to 6 am	2850	2850	2850	2850	2850	2850	2850
6 am to 7 am	2850	2850	2850	2850	2850	2850	2850
7 am to 8 am	2850	2850	2850	2850	2850	2850	2850
8 am to 9 am	2850	2850	2850	2850	2850	2850	2850
9 am to 10 am	2850	2850	2850	2850	2850	2850	2850
10 am to 11 am	2850	2850	2850	2850	2850	2850	2850
11 am to Noon	2850	2850	2850	2850	2850	2850	2850
Noon to 1 pm	2850	2850	2850	2850	2850	2850	2850
1 pm to 2 pm	2850	2850	2850	2850	2850	2850	2850
2 pm to 3 pm	2850	2850	2850	2850	2850	2850	2850
3 pm to 4 pm	2850	2850	2850	2850	2850	2850	2850
4 pm to 5 pm	2850	2850	2850	2850	2850	2850	2850
5 pm to 6 pm	2850	2850	2850	2850	2850	2850	2850
6 pm to 7 pm	2850	2850	2850	2850	2850	2850	2850
7 pm to 8 pm	2850	2850	2850	2850	2850	2850	2850
8 pm to 9 pm	2850	2850	2850	2850	2850	2850	2850
9 pm to 10 pm	2850	2850	2850	2850	2850	2850	2850
10 pm to 11 pm	2850	2850	2850	2850	2850	2850	2850
11 pm to Midnight	2850	2850	2850	2850	2850	2850	2850

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
 Number of Hours per week of restrictions = 168 hr(s)

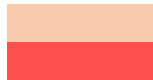


Alternative 2

Queuing for Southbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 pm to 6 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend:

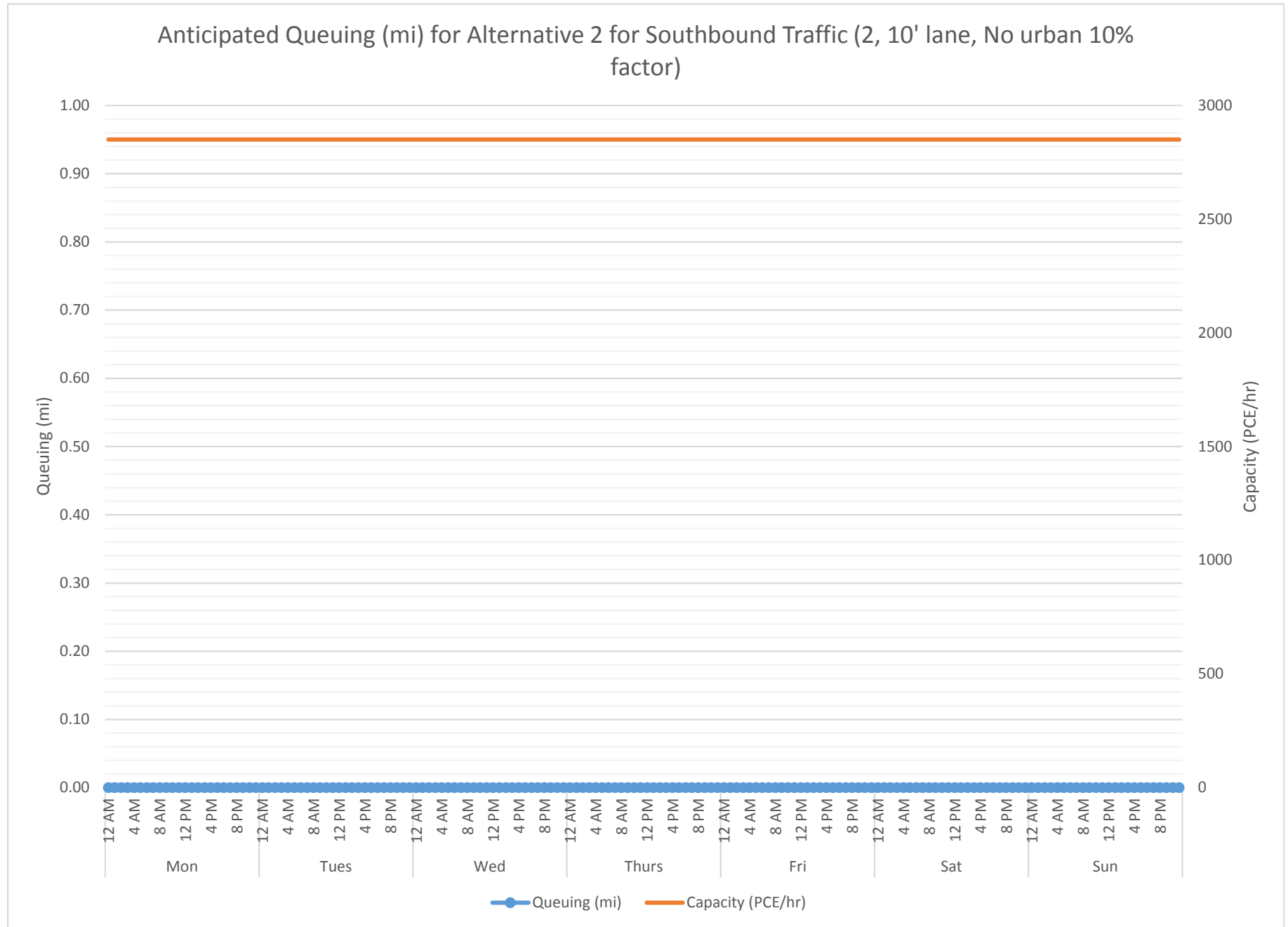


Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 0.0 mi
 Total queue length-hours = 0 mi-hrs
 Total hours with queue = 0 hrs





Alternative 2

Capacities for Northbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	2850	2850	2850	2850	2850	2850	2850
1 am to 2 am	2850	2850	2850	2850	2850	2850	2850
2 am to 3 am	2850	2850	2850	2850	2850	2850	2850
3 am to 4 am	2850	2850	2850	2850	2850	2850	2850
4 am to 5 am	2850	2850	2850	2850	2850	2850	2850
5 am to 6 am	2850	2850	2850	2850	2850	2850	2850
6 am to 7 am	2850	2850	2850	2850	2850	2850	2850
7 am to 8 am	2850	2850	2850	2850	2850	2850	2850
8 am to 9 am	2850	2850	2850	2850	2850	2850	2850
9 am to 10 am	2850	2850	2850	2850	2850	2850	2850
10 am to 11 am	2850	2850	2850	2850	2850	2850	2850
11 am to Noon	2850	2850	2850	2850	2850	2850	2850
Noon to 1 pm	2850	2850	2850	2850	2850	2850	2850
1 pm to 2 pm	2850	2850	2850	2850	2850	2850	2850
2 pm to 3 pm	2850	2850	2850	2850	2850	2850	2850
3 pm to 4 pm	2850	2850	2850	2850	2850	2850	2850
4 pm to 5 pm	2850	2850	2850	2850	2850	2850	2850
5 pm to 6 pm	2850	2850	2850	2850	2850	2850	2850
6 pm to 7 pm	2850	2850	2850	2850	2850	2850	2850
7 pm to 8 pm	2850	2850	2850	2850	2850	2850	2850
8 pm to 9 pm	2850	2850	2850	2850	2850	2850	2850
9 pm to 10 pm	2850	2850	2850	2850	2850	2850	2850
10 pm to 11 pm	2850	2850	2850	2850	2850	2850	2850
11 pm to Midnight	2850	2850	2850	2850	2850	2850	2850

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
Number of Hours per week of restrictions = 168 hr(s)

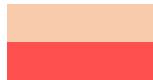


Alternative 2

Queuing for Northbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 pm to 6 pm	0.0	0.0	0.0	0.0	1.1	0.0	1.0
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend:

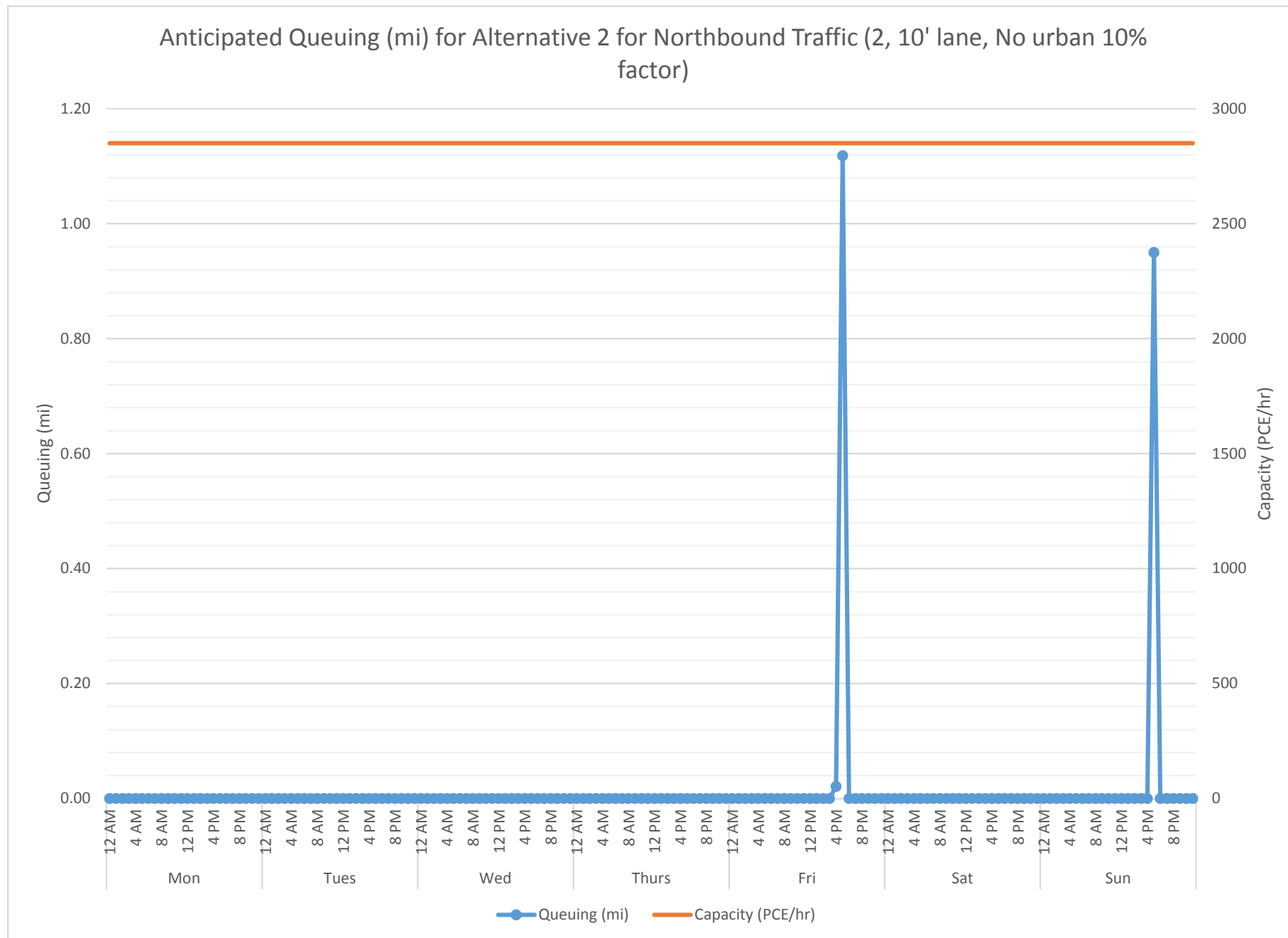


Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 1.1 mi
 Total queue length-hours = 2 mi-hrs
 Total hours with queue = 3 hrs





Alternative 3

Capacities for Southbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	3300	3300	3300	3300	3300	3300	3300
1 am to 2 am	3300	3300	3300	3300	3300	3300	3300
2 am to 3 am	3300	3300	3300	3300	3300	3300	3300
3 am to 4 am	3300	3300	3300	3300	3300	3300	3300
4 am to 5 am	3300	3300	3300	3300	3300	3300	3300
5 am to 6 am	3300	3300	3300	3300	3300	3300	3300
6 am to 7 am	3300	3300	3300	3300	3300	3300	3300
7 am to 8 am	3300	3300	3300	3300	3300	3300	3300
8 am to 9 am	3300	3300	3300	3300	3300	3300	3300
9 am to 10 am	3300	3300	3300	3300	3300	3300	3300
10 am to 11 am	3300	3300	3300	3300	3300	3300	3300
11 am to Noon	3300	3300	3300	3300	3300	3300	3300
Noon to 1 pm	3300	3300	3300	3300	3300	3300	3300
1 pm to 2 pm	3300	3300	3300	3300	3300	3300	3300
2 pm to 3 pm	3300	3300	3300	3300	3300	3300	3300
3 pm to 4 pm	3300	3300	3300	3300	3300	3300	3300
4 pm to 5 pm	3300	3300	3300	3300	3300	3300	3300
5 pm to 6 pm	3300	3300	3300	3300	3300	3300	3300
6 pm to 7 pm	3300	3300	3300	3300	3300	3300	3300
7 pm to 8 pm	3300	3300	3300	3300	3300	3300	3300
8 pm to 9 pm	3300	3300	3300	3300	3300	3300	3300
9 pm to 10 pm	3300	3300	3300	3300	3300	3300	3300
10 pm to 11 pm	3300	3300	3300	3300	3300	3300	3300
11 pm to Midnight	3300	3300	3300	3300	3300	3300	3300

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
 Number of Hours per week of restrictions = 168 hr(s)

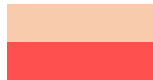


Alternative 3

Queuing for Southbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 pm to 6 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend:

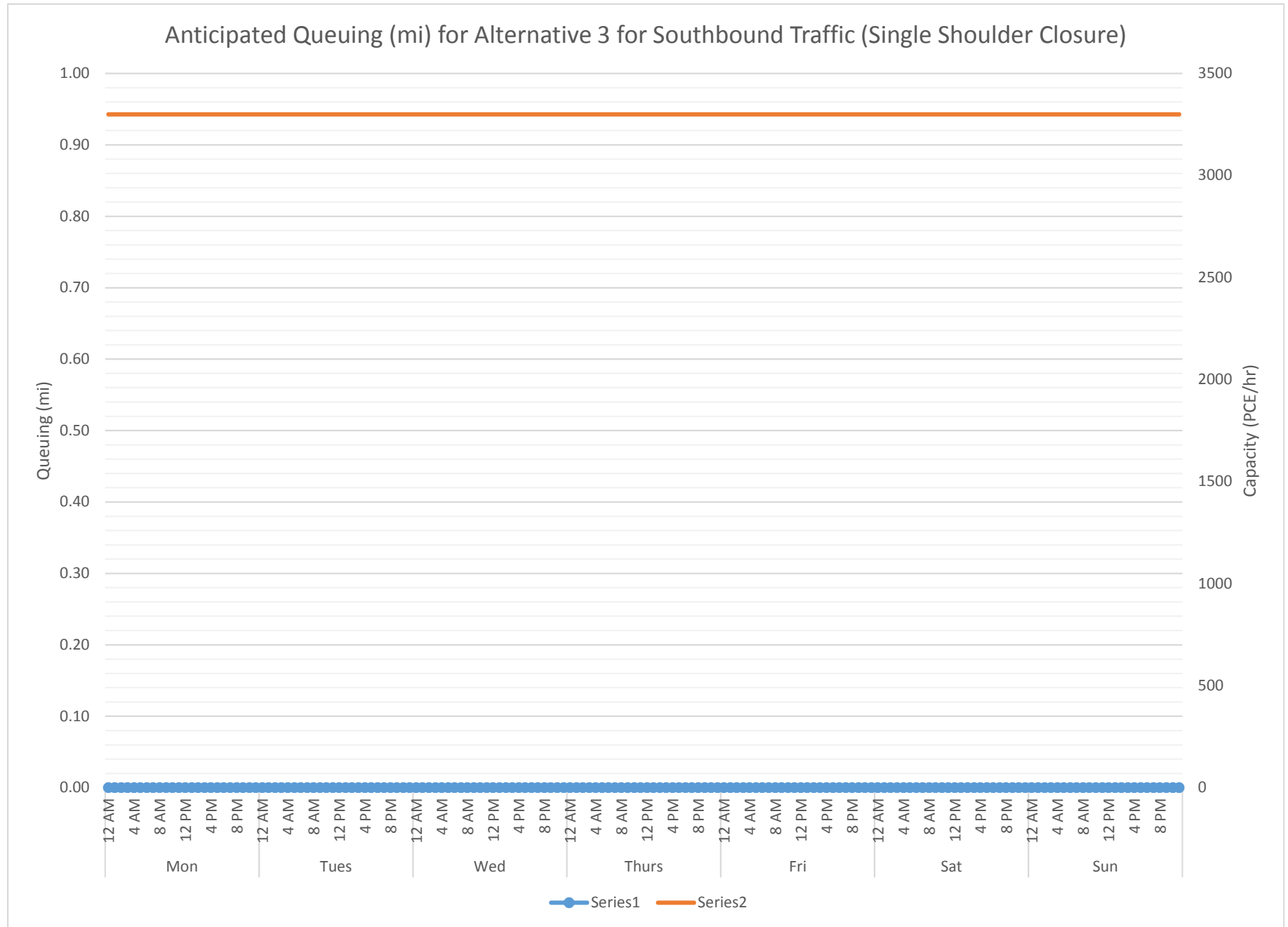


Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 0.0 mi
 Total queue length-hours = 0 mi-hrs
 Total hours with queue = 0 hrs





Alternative 3

Capacities for Northbound Traffic (PCE/hr)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	3300	3300	3300	3300	3300	3300	3300
1 am to 2 am	3300	3300	3300	3300	3300	3300	3300
2 am to 3 am	3300	3300	3300	3300	3300	3300	3300
3 am to 4 am	3300	3300	3300	3300	3300	3300	3300
4 am to 5 am	3300	3300	3300	3300	3300	3300	3300
5 am to 6 am	3300	3300	3300	3300	3300	3300	3300
6 am to 7 am	3300	3300	3300	3300	3300	3300	3300
7 am to 8 am	3300	3300	3300	3300	3300	3300	3300
8 am to 9 am	3300	3300	3300	3300	3300	3300	3300
9 am to 10 am	3300	3300	3300	3300	3300	3300	3300
10 am to 11 am	3300	3300	3300	3300	3300	3300	3300
11 am to Noon	3300	3300	3300	3300	3300	3300	3300
Noon to 1 pm	3300	3300	3300	3300	3300	3300	3300
1 pm to 2 pm	3300	3300	3300	3300	3300	3300	3300
2 pm to 3 pm	3300	3300	3300	3300	3300	3300	3300
3 pm to 4 pm	3300	3300	3300	3300	3300	3300	3300
4 pm to 5 pm	3300	3300	3300	3300	3300	3300	3300
5 pm to 6 pm	3300	3300	3300	3300	3300	3300	3300
6 pm to 7 pm	3300	3300	3300	3300	3300	3300	3300
7 pm to 8 pm	3300	3300	3300	3300	3300	3300	3300
8 pm to 9 pm	3300	3300	3300	3300	3300	3300	3300
9 pm to 10 pm	3300	3300	3300	3300	3300	3300	3300
10 pm to 11 pm	3300	3300	3300	3300	3300	3300	3300
11 pm to Midnight	3300	3300	3300	3300	3300	3300	3300

Legend:



Values that are less than the Recommended Non-work Capacity

Summary:

Recommended Non-work Capacity = 5170
 Number of Hours per week of restrictions = 168 hr(s)

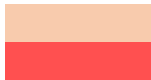


Alternative 3

Queuing for Northbound Traffic (mi)

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Midnight to 1 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 am to 2 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 am to 3 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 am to 4 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 am to 5 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 am to 6 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 am to 7 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 am to 8 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 am to 9 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 am to 10 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 am to 11 am	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 am to Noon	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Noon to 1 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1 pm to 2 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 pm to 3 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3 pm to 4 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 pm to 5 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 pm to 6 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 pm to 7 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 pm to 8 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 pm to 9 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 pm to 10 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 pm to 11 pm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 pm to Midnight	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend:

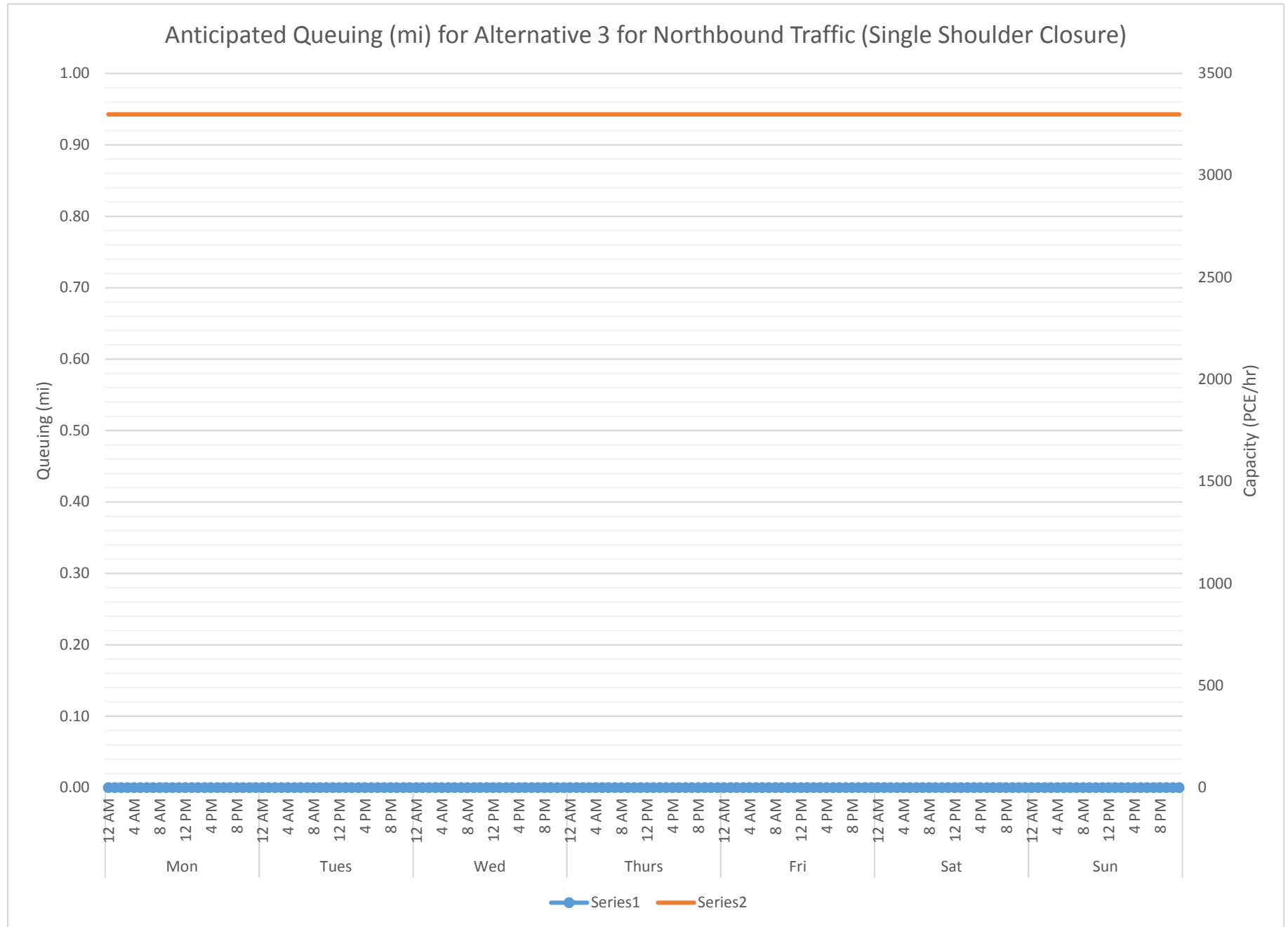


Queues greater than zero, but less than 1.5 miles

Queues greater than or equal to 1.5 miles

Summary:

Maximum Queue Length = 0.0 mi
 Total queue length-hours = 0 mi-hrs
 Total hours with queue = 0 hrs



Closure: I-65 NB Ramp A to 71st Street								
Analyst: John Doe		Date: 3/15/2017		Contract #: R-12345				
Rural/Urban: Urban		Month of Work: August		Adj. Factor: 1				
	I-65 NB Ramp A to 71st Street	I-65 NB	I-65 after I-865 Merge	I-65 to Whitestown	Whitestown to I-65	I-65 SB before I-865 interchange	I-65 SB after I-865 interchange	I-65 Ramp C to 71st Street
	Closed Ramp	Detour: Link 1	Detour: Link 2	Detour: Link 3	Detour: Link 4	Detour: Link 5	Detour: Link 6	Detour: Link 7
# Lanes	1	2	3	2	1	3	2	1
Speed	40	45	70	40	40	70	45	40
Time	Link Type: Ramp (Signalized Intersection)	Link Type: Interstate (Mainline)	Link Type: Interstate (Mainline)	Link Type: Ramp (Signalized Intersection)	Link Type: Ramp (Signalized Intersection)	Link Type: Interstate (Mainline)	Link Type: Interstate (Mainline)	Link Type: Ramp (Signalized Intersection)
12	33	434	792	100	105	1044	734	39
1	15	380	690	55	37	811	582	17
2	16	413	690	63	44	783	554	13
3	12	428	714	59	54	797	516	19
4	13	646	1031	79	131	1079	728	35
5	20	917	1466	278	319	1686	1128	56
6	85	1558	2519	414	783	2702	1665	129
7	199	1692	2707	671	1299	4099	2411	173
8	174	1740	2785	623	1065	3683	2293	160
9	132	1523	2758	566	752	2946	1891	99
10	125	1635	2957	485	520	2837	1806	82
11	129	1676	3067	555	535	2635	1615	71
12	156	1736	3039	552	577	2967	1861	89
1	161	1608	3043	658	549	2949	1865	82
2	159	1823	3270	682	592	2717	1739	85
3	274	2030	3649	837	678	3508	2249	124
4	476	2546	4304	1090	716	3451	2314	118
5	609	2844	4454	1414	617	3434	2371	137
6	383	1972	3323	853	600	3256	2137	125
7	217	1229	2256	563	354	2291	1503	77
8	167	1092	1964	433	283	2022	1334	63
9	120	824	1546	299	159	1471	1018	54
10	93	788	1304	213	159	1381	921	44
11	65	588	1013	127	106	1321	931	35

Key:	Retrieved from Elsewhere in Workbook
	Requires Copied/Entered Data
	Automatic Calculations
	Time Of Interest

Time of Proposed Closure

Type: Weekday or Night-time Only

Time	Monday-Thursday	Friday	Saturday	Sunday
12	x		x	x
1	x		x	x
2	x		x	x
3	x		x	x
4	x		x	x
5	x		x	x
6	x		x	x
7			x	x
8			x	x
9			x	x
10			x	x
11			x	x
12			x	x
1			x	x
2			x	x
3			x	x
4			x	x
5			x	x
6			x	x
7			x	x
8			x	x
9		x	x	x
10		x	x	x
11		x	x	x

Traffic Analysis of Burden on Detour Route as a Result of
Closure of I-65 NB Ramp A to 71st Street: Weekday

Time	I-65 NB Ramp A to 71st Street	I-65 NB		I-65 after I-865 Merge		I-65 to Whitestown		Whitestown to I-65		I-65 SB before I-865 interchange		I-65 SB after I-865 interchange		I-65 Ramp C to 71st Street	
	Closed Ramp	Detour: Link 1		Detour: Link 2		Detour: Link 3		Detour: Link 4		Detour: Link 5		Detour: Link 6		Detour: Link 7	
	Link Type: Ramp (Signalized Intersection)	Link Type: Interstate (Mainline)		Link Type: Interstate (Mainline)		Link Type: Ramp (Signalized Intersection)		Link Type: Ramp (Signalized Intersection)		Link Type: Interstate (Mainline)		Link Type: Interstate (Mainline)		Link Type: Ramp (Signalized Intersection)	
	Base (Weekday Detour) BRC _W	Link 1 Base B1 _W	Link 1 Weekday Total B1 _W + BRC _W	Link 2 Base B2 _W	Link 2 Weekday Total B2 _W + BRC _W	Link 3 Base B3 _W	Link 3 Weekday Total B3 _W + BRC _W	Link 4 Base B4 _W	Link 4 Weekday Total B4 _W + BRC _W	Link 5 Base B5 _W	Link 5 Weekday Total B5 _W + BRC _W	Link 6 Base B6 _W	Link 6 Weekday Total B6 _W + BRC _W	Link 7 Base B7 _W	Link 7 Weekday Total B7 _W + BRC _W
12	33	434	467	792	825	100	133	105	138	1,044	1,077	734	767	39	72
1	15	380	395	690	705	55	70	37	52	811	826	582	597	17	32
2	16	413	429	690	706	63	79	44	60	783	799	554	570	13	29
3	12	428	440	714	726	59	71	54	66	797	809	516	528	19	31
4	13	646	659	1,031	1,044	79	92	131	144	1,079	1,092	728	741	35	48
5	20	917	937	1,466	1,486	278	298	319	339	1,686	1,706	1,128	1,148	56	76
6	85	1,558	1,643	2,519	2,604	414	499	783	868	2,702	2,787	1,665	1,750	129	214
7	199	1,692	1,891	2,707	2,906	671	870	1,299	1,498	4,099	4,298	2,411	2,610	173	372
8	174	1,740	1,914	2,785	2,959	623	797	1,065	1,239	3,683	3,857	2,293	2,467	160	334
9	132	1,523	1,655	2,758	2,890	566	698	752	884	2,946	3,078	1,891	2,023	99	231
10	125	1,635	1,760	2,957	3,082	485	610	520	645	2,837	2,962	1,806	1,931	82	207
11	129	1,676	1,805	3,067	3,196	555	684	535	664	2,635	2,764	1,615	1,744	71	200
12	156	1,736	1,892	3,039	3,195	552	708	577	733	2,967	3,123	1,861	2,017	89	245
1	161	1,608	1,769	3,043	3,204	658	819	549	710	2,949	3,110	1,865	2,026	82	243
2	159	1,823	1,982	3,270	3,429	682	841	592	751	2,717	2,876	1,739	1,898	85	244
3	274	2,030	2,304	3,649	3,923	837	1,111	678	952	3,508	3,782	2,249	2,523	124	398
4	476	2,546	3,022	4,304	4,780	1,090	1,566	716	1,192	3,451	3,927	2,314	2,790	118	594
5	609	2,844	3,453	4,454	5,063	1,414	2,023	617	1,226	3,434	4,043	2,371	2,980	137	746
6	383	1,972	2,355	3,323	3,706	853	1,236	600	983	3,256	3,639	2,137	2,520	125	508
7	217	1,229	1,446	2,256	2,473	563	780	354	571	2,291	2,508	1,503	1,720	77	294
8	167	1,092	1,259	1,964	2,131	433	600	283	450	2,022	2,189	1,334	1,501	63	230
9	120	824	944	1,546	1,666	299	419	159	279	1,471	1,591	1,018	1,138	54	174
10	93	788	881	1,304	1,397	213	306	159	252	1,381	1,474	921	1,014	44	137
11	65	588	653	1,013	1,078	127	192	106	171	1,321	1,386	931	996	35	100
Maximum Value (PCE/HR):		2,844	1,643	4,454	2,604	1,414	499	1,299	868	4,099	2,787	2,411	1,750	173	214
Number of Lanes:		2		3		2		1		3		2		1	
Speed Limit (mph):		45		70		40		40		70		45		40	
Theoretical Capacity (PCE/HR):		3,800		7,200		1,280		640		7,200		3,800		640	
Result:		Acceptable		Acceptable		Acceptable		Acceptable		Acceptable		Acceptable		Potential Issue	
Remark:		Theoretical Capacity is 2850 PCE/HR for work zone										Theoretical Capacity is 2850 PCE/HR for work zone			



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Traffic Management Center
8620 East 21st Street
Indianapolis, Indiana 46219

PHONE: (317) 899-8610
FAX: (317) 898-0897

Eric Holcomb, Governor
Joe McGuinness, Commissioner

INTERSTATE HIGHWAYS CONGESTION POLICY EXCEPTION REQUEST ANALYSIS AND JUSTIFICATION

RE: [ProjectDescription]
[Route] in the [Direction(s)] direction(s) from [Location] to [Location] (MM [n] to MM [n]) in [Counties]
Contract No. [XX-nnnnn], Des. No. [nnnnnnn]
Prime Contractor: [ContractorName]

NEED FOR WORK

[NeedForWork]. [EffectOnRoute]. This work is planned for a [WorkTimeFrame].

PLANNED CLOSURES/RESTRICTIONS

[ClosureDescription] [ClosureSchedule]. These closures are anticipated to begin [ExpectedStartDate] and last [ExpectedDuration].

ANALYSIS

Traffic impacts due to the closures were analyzed using [AnalysisTool]. The traffic volumes used in the analysis were obtained from [CountSource]. The counts were taken from [CountStation] on [CountDate] for the segment [Segment]. The capacity used in the analysis is the Highway Capacity Manual's typical value adjusted for the proximity of the work to the travel lane resulting in [WZLaneCapacity] PCE/Hr/Ln. This capacity corresponds to a [LaneWidth] ft. lane width.

[RelevantInformation].

The analyses indicate that queue [within/outside] policy limits should be anticipated as a result of this work. The results indicate that a maximum queue length of approximately [MaxQueueLength] miles may be experienced for a maximum of [MaxQueueDuration] hours on [Day] at [Time] in the [Direction] direction. The results indicate that a maximum queue length of approximately [MaxQueueLength] miles may be experienced for a maximum of [MaxQueueDuration] hours on [Day] at [Time] in the [OppositeDirection] direction. Please see the attached analyses and charts for further details on the queue modeling.

INDOT's construction staff has done several closures similar to this and will be working closely with the TMC to assure that minimal congestion in the work zone is achieved.

SELECTED WORK SCHEDULE

[SelectedWorkschedule]. [Justification].

ABBREVIATED TRANSPORTATION MANAGEMENT PLAN (TMP)

The following Abbreviated TMP will be followed throughout the construction of this project:

Traffic Control Plan (TCP)

The following is an outline of the TCP:

- The PE/PS (or the Contractor if so designated by the PE/PS) will notify the TMC at least 3-days ahead of any MOT change so that the appropriate ATIS messages (if available) can be displayed to inform motorists of the upcoming closure and for general information concerning the status of traffic operations on the Interstate Highways. The E-mail addresses for these notifications are: indpc@isp.IN.gov and indytmc@indot.IN.gov. The PE/PS (or the Contractor if so designated by the PE/PS) shall call the TMC (317-899-8690x1) immediately prior to implementing any lane or shoulder restriction as a final notification and to provide project contacts / phone numbers that will be available for the duration of the restriction.
- All lane or shoulder restrictions will be closed and/or shifted in accordance with the IMUTCD and INDOT Specifications 105, 107 and 801.
- Unless explicitly stated otherwise in this Approval, Recurring Special Provision 108-C-585, which concerns holiday closures, will be followed.
- [SpecialTemplateBullets]

Traffic Operations Plan (TOP)

Lane restriction information will be transmitted by TMC to ITS boards in advance of this area and will notify motorists of the work, well in advance of the closure, as ITS boards are available.

Public Information

Simultaneous to the TMC notification noted above, the PE/PS (or the Contractor if so designated by the PE/PS) shall notify the INDOT District Media Contact responsible for the area of the restriction at least 3-days in advance of the closure. The Media Contacts can be found at www.media.indot.in.gov which redirects to www.in.gov/indot/2364.htm. They will insure that local television news channels, radio stations and newspapers will be notified of this construction. Local commuters will be advised to avoid this area and use alternative local routes if possible. They will also insure that the Indiana Motor Trucking Association is notified to minimize the number of trucks that will use these detour routes.

Prepared by:

[NameOfPreparer]

[TitleOrPosition]

Phone Number: [PhoneNumber]

Email: [EmailAddress]

Reviewed by:

[InitialReviewer], [Title]

[Department]

Phone Number: [PhoneNumber]

Email: [EmailAddress]

[Department] Comments:

(Do not include this page and any that follow in the submittal)

OPTIONAL TMP BULLETS (situation specific)

- The speed reduction will be in accordance with INDOT Construction Memorandum 14-06 unless a Temporary Official Action has been issued. This includes approval by the District Traffic Engineer and recordkeeping by both District Traffic and District Construction.
- Unless determined otherwise by the PE/PS based on site conditions, Portable Changeable Message Signs (PCMS's) will be placed approximately 2 miles ahead of the construction signing to alert drivers that they should expect stopped or slowed traffic. If queuing is observed, extending within a ¼ mile of the PCMS's, the Contractor will adjust the PCMS placement to a position where they are at least ½ mile (but not more than 2 miles) in advance of the maximum observed queue.
- PCMS's shall be installed, in series, 2-minimum in each direction for each lane restriction to fully advise motorists of the excessive queues in accordance with the *INDOT Guidelines for Portable Changeable Message Signs (PCMS)*. The guidelines can be found at: <http://www.in.gov/dot/div/contracts/design/PCMS.pdf>. Great care should be used to monitor the excessive queues and place the PCMS's in advance of the observed queues to mitigate the risk to all stakeholders.
- PCMS's shall be installed in accordance with the *INDOT Guidelines for Portable Changeable Message Signs (PCMS)*. The guidelines can be found at: <http://www.in.gov/dot/div/contracts/design/PCMS.pdf>. Care should be used to monitor the excessive queues and place the PCMS's in advance of the observed queues to mitigate the risk to all stakeholders.
- Portable Temporary Rumble Strips should be incorporated into the lane restrictions and placed in advance of the queues in accordance with Recurring Special Provision 801-T-209 and 801-T-209d.
- In instances where observed queuing is significantly greater than queuing predicted by modeling during the design phase, Portable Temporary Rumble Strips should be considered as a measure to mitigate the risk caused by those lane restrictions. They should be placed in advance of the observed queues in accordance with Recurring Special Provision 801-T-209 and 801-T-209d.
- 'Watch for Stopped Traffic' signs shall be placed in advance of the queue.
- The Supervisor of the Traffic Control Systems Section at the TMC shall be notified at least three business days before the detour. The hourly traffic volumes passing through the signalized intersection for the duration of the detour will be reported to the Traffic Control Systems Section.
- The Federal Highway Administration (FHWA) must grant approval of this closure before work can commence. (Interstate to interstate ramp or complete mainline closure.)

- The superintendent and one other responsible employee will be on call during all non-working periods to oversee the repair or replacement of all traffic control devices which may become damaged or inoperative.
- If any lane closure occurs, other than what is allowed under this exception request, \$2,500.00 will be assessed as liquidated damages.
- The inside and outside shoulders may be utilized for maintaining traffic in accordance with the plans.
- The PE/PS is strongly encouraged to request ISP support for the work zone, as soon as restriction dates are known – at least 3-days in advance of the lane restrictions. Contact Kim Peters (317-899-8619 / kpeters@indot.IN.gov) or Guy Boruff (317-899-8605 / gboruff@insot.IN.gov) to make these requests.
- The PE/PS is encouraged to consider the use of ISP support for the work zone as they may be beneficial and protect motorists and workers. Requests should be made as soon as restriction dates are known – at least 3-days in advance of the lane restrictions. Contact Kim Peters (317-899-8619 / kpeters@indot.IN.gov) or Guy Boruff (317-899-8605 / gboruff@insot.IN.gov) to make these requests.

FIELD DESCRIPTIONS

Fields may be expanded to multiple lines as needed.

[ProjectDescription]	Description of the type of project, work involved and location.
[Direction(s)]	One or more of the following: northbound, southbound, eastbound or westbound.
[Location]	Description of the location of relative to crossing roadways, crossing railways, crossing streams, entrance and exit ramps, etc.
[n]	Number.
[Counties]	County or Counties in which the project is located.
[XX-nnnnn]	Contract Number
[ContractorName]	Name of the Prime Contractor.
[nnnnnnn]	Des Number
[NeedForWork]	Describe the work that needs to be done and why.
[EffectOnRoute]	How, when and why the route will be affected by the work.
[WorkTimeFrame]	When the work will be occurring.

[ClosureDescription]	[ClosureSchedule]	Lanes, ramps or shoulders being closed/restricted, where and closure hours. For example: Single lane closure on southbound I-65, nighttime closures Full ramp closure on northbound I-65 at Exit 99, weekend closures Outside shoulder closure on westbound I-79, nighttime closures
[ExpectedStartDate]		When the closure/restriction will first go into effect. For example: Monday night, May 1, 2017 at 9 PM Spring 2018
[ExpectedDuration]		Length of time closures/restrictions will be in effect. For example: For the duration of the contract. From March 2017 through June 2017
[AnalysisTool]		Name of the analysis software or tool used. For example: INDOT's Queue Analysis Spreadsheet (V1.24) QuickZone 2.0
[CountSource]		The source of the traffic counts. Typically, this should be INDOT's Traffic Count Database System (TCDS)
[CountStation]		The source of the traffic counts. Typically, this should be INDOT's Traffic Count Database System (TCDS)
[CountDate]		The date of the traffic counts.
[Segment]		The segment of the traffic counts, from _ to _.
[WZLaneCapacity]		Capacity of lane in work zone (See IHCP Table C-3.)
[LaneWidth]		Lane width through work zone.
[Relevant Information]		Any other relevant information to the analysis.
[MaxQueueLength]		Maximum length of queue
[MaxQueueDuration]		Maximum duration of queue
[Direction]		One of the following: northbound, southbound, eastbound or westbound.

[SelectedWorkschedule]	.....	Work schedule for the closures based on thoughtful selection of hours to minimize congestion and queues while improving safety for both workers and motorists.
[Justification]	.....	Justification for the selected work schedule.
[SpecialTemplateBullets]	.....	Enter any other special considerations to be included in the TCP. See “optional” bullets on page 4 of this document for suggestions.



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Traffic Management Center
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Eric Holcomb, Governor
Joe McGuinness, Commissioner

INTERSTATE HIGHWAYS CONGESTION POLICY EXCEPTION REQUEST ANALYSIS AND JUSTIFICATION

RE: Added Travel Lanes & HMA Overlay
I-65 both directions from I-465 N Jct. to I-865 (MM 122.92 to MM 129.21) Marion
County
Contract No. R-12345, Des. No. 1234567
NEED FOR WORK

Due to the increase in demand on this segment of I-65 another travel lane will be needed to compensate for the increase in demand. The work being performed is to widen the interstate from 2 lanes to 3 lanes; bridges over 71st street and over water ways will also be widened. A request for a lane reduction and shoulder closure on I-65 in both directions. Along with the widening of the roadway, deep patching of concrete pavement, replacing of overhead sign structures and hot mix asphalt overlay will also be performed during this projects lifetime. This preventative maintenance work is needed to prolong the lanes that are in existence. This work is planned for the construction year of 2017.

PLANNED CLOSURES/RESTRICTIONS

The following are the planned closures for this project:

- Reduce mainline lane width on I-65 in both directions between I-465 N Jct. and I-865 to 10 ft. per lane, continuous (24/7) closure with work prohibited from 3:00 PM to 7:00 PM on Fridays
- Single (left or right) shoulder closure along edge of travel way on I-65 in both directions between I-465 and I-865, continuous (24/7)
- I-65 NB & SB @ 71st Street entrance and exit ramps, full closure, 1 weekend (9:00 PM Friday to 6:00 AM Monday) per ramp and weeknights (12:00 AM to 6 AM Monday through Thursday nights)
- I-65 NB & SB S of 71st Street, Full closure for up to 20 minutes as alternative to a rolling slowdown, As needed on Saturdays between 6:00 AM and 10:00 AM

Narrowing of the roadway is anticipated throughout the construction season of 2017. Full closure for up to 20 minutes as alternative to rolling slowdowns are also anticipated to occur on Sundays from 6 AM to 10 AM. The Ramp closures at 71st Street will occur during the weekend hours (Friday 9 PM to Monday 6 AM) and Monday to Thursday 12 AM to 6 AM for prep work, a single week per entrance and exit ramp in the construction season of 2017. Ramps A and B on 71st Street can be closed concurrently, as well as, ramps C and D. However, Ramps A and C may not be closed concurrently; ramps B and D may not be closed concurrently.

ANALYSIS

Traffic impacts due to the closures were analyzed using Queue Analysis V1.26a, Detour Route Summary. The traffic volumes used in the analysis were obtained from INDOT's Traffic Count Database System. The counts used for the Queue Analysis were taken from 971430 on Monday June 20, 2016 for the segment of I-65 1.00 mile north of 71st Street. The capacity used in the analysis is the Highway Capacity Manual's typical value adjusted for the proximity of the work to the travel lane resulting in 3135 PCE/Hr. This capacity was found by using the IHCP 2017 tables. Table C-6 was used for the capacity of the lane adjacent to the closed shoulder, which was 1400 PCE/Hr, and the table C-3 was used for the second lane. The capacity used from Table C-3 was 1450 PCE/Hr, which corresponds to a 10' to 10.9' lane. Total capacity was increased by 10% for the urban factor for alternative 3, but not alternative 4.

A total of five alternatives were analyzed to determine a safe and efficient time to work. Initially a single lane and shoulder closures for 24/7 throughout the construction season were analyzed. However, this analysis computed queueing up to 12.61 miles in the southbound direction and 13.07 miles in the northbound direction. The analysis anticipated queueing that would fail all four criteria.

The second alternative that was computed was weeknights and weekend work only. The analysis anticipated large queueing on Saturdays and Sundays. The largest anticipated queueing occurs on Sunday in the southbound direction with 4.22 miles of queueing at 8 PM. The queue in the southbound direction occurs from noon to 11 PM. For Tuesday through Friday, the analysis showed queueing within policy limits. The northbound direction doesn't show queueing on the weekdays, but shows excessive queueing on Saturday and Sunday. The largest anticipated queue for northbound is 9.64 miles on Sunday at 6 PM. Queueing in the northbound direction lasts from noon to midnight.

The third alternative that was analyzed was two 10' lanes. Northbound direction shows queueing at the 5 PM time on Friday and Sunday for 1 hour. The maximum queueing calculated was 0.35 miles on Friday at 5 PM to 6 PM. The southbound shows queueing within policy limits and minimal queueing should be anticipated.

The fourth alternative was a worst-case scenario for the two 10' lanes. Since lanes are being narrowed to 10 foot lanes, it is believed that motorists will drive less aggressive even in urban areas. The 10% urban factor was not factored into the capacity. The capacity for this alternative is 2850 PCE/Hr. Queueing within policy limits still existed for the southbound lane, and minimal queueing should be anticipated in that direction. The northbound direction had a maximum queue of 1.12 miles at 5 PM on Friday. The queueing occurred during the 4 and 5 PM hours.

The final alternative that was analyzed was a shoulder closure. The results of this analysis indicated queue within policy limits for both directions. Minimal queueing should be anticipated for shoulder closures.

Four alternative routes were also analyzed using the detour route summary spreadsheet. The first two ramps to be closed will be the I-65 northbound Ramp A to 71st Street and I-65 northbound ramp B from 71st Street. The traffic for ramp A is being routed north to Whitestown Road ramp and then back to I-65 Ramp C to 71st Street. The traffic for ramp B is being routed south to Lafayette Road and back up to I-65. The analysis anticipates queueing to occur on the Whitestown exit ramp from I-65 north and anticipated minimal queueing as a result of closing Ramp B. To mitigate these queues on the ramps, the signals engineer should be contacted and notified about these closures.

The other alternative routes that were analyzed were for the closure of I-65 SB Ramp C to 71st Street and the closure of Ramp D. The traffic for ramp C is being routed south to Lafayette Road and then back to I-65 Ramp A to 71st Street. The Traffic for ramp D is being routed north to Whitestown Road and back to I-65 SB. Minimal queueing is anticipated to occur due to the closure of ramp C. However, greater queueing will occur during the ramp D closure.

To help mitigate the additional queueing caused by the restriction and shoulder closure, PCMS's will be placed within the project. The PCMS's should inform motorists that slow or stopped traffic should be anticipated ahead and that trucks should consider alternative routes due to the narrowing of lane widths.

In addition to the placement of PCMS's, signs informing motorists of the narrowing of lanes ahead should be placed. Contact with the Signal Technical Engineer should be made to determine if changes need to be made at the signalized intersection throughout the detour route. INDOT's construction staff has done several closures similar to this and will be working closely with the TMC to assure that minimal congestion in the work zone is achieved.

SELECTED WORK SCHEDULE

Work is anticipated to begin March 1st and conclude at the end of the 2017 construction season. The restriction that will occur throughout the project is a narrowing of lanes and shoulder closure. The lanes will be 10 foot lanes and 2 foot minimum shoulder. Work is planned throughout the week and weekend. This time was selected since it has the least impact on the traffic seen in this segment.

The Ramp closures at 71st Street will occur during the weekend hours (Friday 9 PM to Monday 6 AM) and Monday to Thursday 12 AM to 6 AM for prep work, a single weekend per entrance and exit ramp in the construction season of 2017. Ramps A and B on 71st Street can be closed concurrently, as well as, ramps C and D. However, Ramps A and C may not be closed concurrently; ramps B and D may not be closed concurrently. This time was selected because the concrete has

to have time to cure and the weekend timeframe will have the least impact on the traffic seen on these ramps.

ABBREVIATED TRANSPORTATION MANAGEMENT PLAN (TMP)

The following Abbreviated TMP will be followed throughout the construction of this project:

Traffic Control Plan (TCP)

The following is an outline of the TCP:

- The PE/PS (or the Contractor if so designated by the PE/PS) will notify the TMC at least 3-days ahead of any MOT change so that the appropriate ATIS messages (if available) can be displayed to inform motorists of the upcoming closure and for general information concerning the status of traffic operations on the Interstate Highways. The E-mail addresses for these notifications are: indpc@isp.IN.gov and indytmc@indot.IN.gov. The PE/PS (or the Contractor if so designated by the PE/PS) shall call the TMC (317-899-8690x1) immediately prior to implementing any lane or shoulder restriction as a final notification and to provide project contacts / phone numbers that will be available for the duration of the restriction.
- All lane or shoulder restrictions will be closed and/or shifted in accordance with the IMUTCD and INDOT Specifications 105, 107 and 801.
- Unless explicitly stated otherwise in this Approval, Recurring Special Provision 108-C-585, which concerns holiday closures, will be followed.
- PCMS's should be placed further back than the longest recorded queue to inform motorists that slow or stopped traffic should be anticipated. Other PCMS should be placed to inform trucks that they should consider alternative routes due to the narrowing of the lane widths.
- Road Signs should be placed to inform motorists of narrowing lanes.

Traffic Operations Plan (TOP)

Lane restriction information will be transmitted by TMC to ITS boards in advance of this area and will notify motorists of the work, well in advance of the closure, as ITS boards are available.

Public Information

Simultaneous to the TMC notification noted above, the PE/PS (or the Contractor if so designated by the PE/PS) shall notify the INDOT District Media Contact responsible for the area of the restriction at least 3-days in advance of the closure. The Media Contacts can

be found at www.media.indot.in.gov which redirects to www.in.gov/indot/2364.htm. They will insure that local television news channels, radio stations and newspapers will be notified of this construction. Local commuters will be advised to avoid this area and use alternative local routes if possible. They will also insure that the Indiana Motor Trucking Association is notified to minimize the number of trucks that will use these detour routes.

Prepared by:

John Doe, Engineer
Consultant Co.
Phone Number: (555)555-5555
Email: johndoe@contractor.edu

Reviewed by:

[InitialReviewer], [Title]
[Department]
Phone Number: [PhoneNumber]
Email: [EmailAddress]

[Department] Comments:



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Eric Holcomb, Governor
Joe McGuinness, Commissioner

April 24, 2017

TO: Louis Feagans, Director
Statewide Technical Services

THRU: [SecondaryReviewer], [Title]
[Department]

FROM: [InitialReviewer], [Title]
[Department]

SUBJECT: Interstate Highway Congestion Policy Exception Request
[ProjectDescription]
[Route] in the [Direction(s)] direction(s) from [Location] to [Location] (MM [n] to MM [n]) in
[Counties]
Contract No. [XX-nnnnn], Des. No. [nnnnnnn]

We have reviewed the attached policy exception request prepared by [Preparer'sName] and concur with the analyses presented.

IHCP Allowable Closure: [IHCPPreapprovedClosureDescription]

Requested Closures: [ClosureDescription] of [Direction(s)] [Route], [ClosureSchedule]

Minimum Open Lanes: [n] lane(s) in [Direction(s)] direction will remain open during the closure period(s).

Anticipated Start of Closures: [ExpectedStartDate]

Expected Duration of Closure: [ExpectedDuration]

Lane Width: [LaneWidth] ft.

Shoulder Width: [ShoulderWidth] ft.

Type of barrier used: [BarrierType]

The analyses indicate that queue [within/outside] policy limits is anticipated from this closure.

Policy Exception Approved:

Louis Feagans, Director
Statewide Technical Services

Date

Enclosures: Policy Exception Request, Queue Analysis, [Attachments]

cc: [Name], Supervisor, Work Zone Safety Section, Indianapolis Traffic Management Center
[Name*], Supervisor, Traffic Control Systems Section, Indianapolis Traffic Management Center
[Name], Deputy Commissioner, [District] District
[Name], Director, Construction Division, [District] District
[Name], Director, Technical Services Division, [District] District
[Name], Director, Highway Maintenance Division, [District] District
[Name], Manager, Design, Production Division, [District] District
[Name], Manager, Traffic, Technical Services Division, [District] District
[Name], Project Manager, Production Division; [District] District
[Name], District Public Information Officer, [District] District
[FHWAContact*]
[RequestPreparer*]
[Others*]

FIELD DESCRIPTIONS

(Do not include this page in the submittal)

Fields may be expanded to multiple lines as needed.

[ProjectDescription]	.....	Description of the type of project, work involved and location.
[Direction(s)]	.....	One or more of the following: northbound, southbound, eastbound or westbound.
[Location]	.....	Description of the location of relative to crossing roadways, crossing railways, crossing streams, entrance and exit ramps, etc.
[n]	.....	Number.
[Counties]	.....	County or Counties in which the project is located.
[XX-nnnnn]	.....	Contract Number
[nnnnnnn]	.....	Des Number
[IHCPPreapprovedClosureDescription]	.....	Preapproved closure listed in Table B-1 of the IHCP for the segment(s) covered by this exception request.
[ClosureDescription]	[ClosureSchedule]	Lanes, ramps or shoulders being closed, where and closure hours. For example: Single lane closure on southbound I-65, nighttime closures Full ramp closure on northbound I-65 at Exit 99, weekend closures Outside shoulder closure on westbound I-79, nighttime closures
[ExpectedStartDate]	.....	When the closure will first go into effect. For example: Monday night, May 1, 2017 at 9 PM Spring 2018
[ExpectedDuration]	.....	Length of time closures will be in effect. For example: For the duration of the contract. From March 2017 through June 2017
[LaneWidth]	.....	Lane width of open lanes.
[ShoulderWidth]	.....	Shoulder width provided for open lanes.
[BarrierType]	.....	Temporary Concrete Barrier, Construction Drums, etc.
[Attachments]	.....	List any other documentation being attached.

The provided distribution list is the minimum to include. The request preparer should be listed as well. Items with a (*) are optional or depend on the nature of the closure.



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Eric Holcomb, Governor
Joe McGuinness, Commissioner

May 5, 2017

TO: Louis Feagans, Director
Statewide Technical Services

THRU: Mischa Kachler, Supervisor
Work Zone Safety Section

FROM: Gerry J. Montgomery, Engineer
Work Zone Safety Section

SUBJECT: Interstate Highway Congestion Policy Exception Request
Added Travel Lanes & HMA Overlay
I-65 in both directions from I-465 N Jct. to I-865 (MM 122.92 to MM 129.21) in Marion County
Contract No. R-12345, Des. No. 1234567

We have reviewed the attached policy exception request prepared by [Preparer'sName] and concur with the analyses presented.

IHCP Allowable Closure:

Single mainline lane closure, Nighttime Only

Reduction in mainline lane width requires exception

Shoulder closure, 9:00 AM to 3:00 PM, 7:00 PM to 6:00 AM, Monday through Friday & Weekend

Full ramp closure requires exception

Rolling Slowdown up to 20 minutes, @ 20 mph and less than 800 PCE/Hr

Requested Closures:

Reduce mainline lane width on I-65 in both directions between I-465 N Jct. and I-865 to 10 ft. per lane, continuous (24/7) closure with work prohibited from 3:00 PM to 7:00 PM on Fridays

Single (left or right) shoulder closure along edge of travelway on I-65 in both directions between I-465 and I-865, continuous (24/7)

I-65 NB & SB @ 71st Street entrance and exit ramps, full closure, 1 weekend (9:00 PM Friday to 6:00 AM Monday) per ramp and weeknights (12:00 AM to 6 AM Monday through Thursday nights)

I-65 NB & SB S of 71st Street, Full closure for up to 20 minutes as alternative to a rolling slowdown, As needed on Saturdays between 6:00 AM and 10:00 AM

Minimum Open Lanes:

2 mainline lanes in both directions will remain open during the periods of reduced lane width

No lanes will remain open on I-65 entrance and exit ramps in both directions during full ramp closures

No lanes will remain open on I-65 NB & SB during 20 min full closures

Anticipated Start of Closures: March 1, 2017

Expected Duration of Closure: Closures under this IHCP Exception will be allowed as needed through 2017 construction season

Full ramp closures @ 71st Street will be limited to 2 closures per ramp

For full ramp closures at 71st Street Ramps A & B may be closed concurrently and Ramps C & D may be closed concurrently but Ramps A & C will not be permitted to be closed concurrently and Ramps B & D will not be permitted to be closed concurrently

20 minute full mainline closures will be limited to 2 per direction

Lane Width: 10 ft. minimum

Shoulder Width: varies - 2 ft. minimum

Type of barrier used: Temporary concrete barrier, construction drums and Type III barricades

The analyses indicate that queue within policy limits is anticipated from this closure. FHWA input has been obtained per the attached email from Joe Fed.

Policy Exception Approved:

Louis Feagans, Director
Statewide Technical Services

Date

Enclosures: Policy Exception Request, FHWA Input Email, Queue Analyses, Detour Route Summary

cc: John McGregor, Supervisor, Traffic Control Systems Section, Indianapolis TMC
[Name], Deputy Commissioner, [District] District
[Name], Director, Construction Division, [District] District
[Name], Director, Technical Services Division, [District] District
[Name], Director, Highway Maintenance Division, [District] District
[Name], Manager, Design, Production Division, [District] District
[Name], Manager, Traffic, Technical Services Division, [District] District
[Name], Project Manager, Production Division; [District] District
[Name], District Public Information Officer, [District] District
[FHWAContact*]
[RequestPreparer*]
[Others*]

