

# Newark Transportation Improvement District (TID) Travel Time Service Standards

Presented to  
Newark TID Committee

July 8, 2020



# Optional – Ideas for capacity-related standards

- Maximum total travel time per segment
- Maximum change in total travel time per segment
- Based on arterial class (number and spacing of traffic signals), speed limits/running time along segments, and intersection delay/LOS
- DeIDOT Recommendation: Capacity-related service standard of a maximum increase in travel time per link and per segment of 10%.



# Existing Travel Times Update

- ⦿ Adjustments to Synchro inputs based on final guidance from DeIDOT Traffic Impact Study engineers
  - Changes to some network-wide signal timing parameters and individual signal timing settings
  - Slight changes to application of Peak Hour Factors and Heavy Vehicle Percentages at intersections
- ⦿ Resulted in minor changes, except for one location.



# Existing Travel Times Update

- For Segment 1, SR72, the NB and SB travel times in the PM peak period switched. In previous results, NB was much higher than SB. Now the results are reversed, due to signal timing changes at E Cleveland Avenue/Woodlawn Avenue intersection.
- The total signal cycle length was increased from 120 to 150 seconds
- More green time was given to the northbound approach of SR 2



# Future Travel Times Results

- Based on 2045 Future Land Use Forecast
- 2,658 future residential units
- 1,728,100 Square Ft of non-residential development
- Includes signal optimization





# Segment 1, SR 72/SR2 from SR4 to Possum Park Road, AM

Travel Time: Segment 1 - SR 72/Library Ave/SR 2 Capitol Trail from SR 4 to Possum Park Rd												
NB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Wyoming Rd	45	1.23	98.7	24.3	123.0	2.05	98.7	19.6	118.3	1.97	-0.08	-4%
College Square Shop. Ctr/Del. Ave	35	0.21	26.6	26.9	53.5	0.89	26.6	28.3	54.9	0.92	0.02	3%
SR 273/Main St	35	0.20	24.6	37.8	62.4	1.04	24.6	29.9	54.5	0.91	-0.13	-13%
Woodlawn Ave/E. Cleveland Ave	35	0.15	19.2	49.6	68.8	1.15	19.2	53.8	73.0	1.22	0.07	6%
Anna Way	35	0.60	61.8	5.1	66.9	1.12	61.8	4.0	65.8	1.10	-0.02	-2%
Possum Park Rd	35	0.45	46.4	22.2	68.6	1.14	46.4	18.6	65.0	1.08	-0.06	-5%
<b>Total:</b>	<b>2.84</b>		<b>277.3</b>	<b>165.9</b>	<b>443.2</b>	<b>7.39</b>	<b>277.3</b>	<b>154.2</b>	<b>431.5</b>	<b>7.19</b>	<b>-0.20</b>	<b>-3%</b>
SB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Anna Way	35	0.45	46.4	2.4	48.8	0.81	46.4	2.0	48.4	0.81	0.00	0%
E. Cleveland Ave/Woodlawn Ave	35	0.60	61.8	68.6	130.4	2.17	61.8	111.9	173.7	2.90	0.72	33%
Main St/SR 273	35	0.15	19.2	24.1	43.3	0.72	19.2	23.1	42.3	0.71	-0.01	-1%
Del. Ave/College Square Shop. Ctr	35	0.20	24.6	22.8	47.4	0.79	24.6	2.7	27.3	0.46	-0.33	-42%
Wyoming Rd	35	0.21	26.6	48.0	74.6	1.24	26.6	25.7	52.3	0.87	-0.37	-30%
SR 4	45	1.23	98.7	29.8	128.5	2.14	98.7	38.0	136.7	2.28	0.14	6%
<b>Total:</b>	<b>2.84</b>		<b>277.3</b>	<b>195.7</b>	<b>473.0</b>	<b>7.88</b>	<b>277.3</b>	<b>203.4</b>	<b>480.7</b>	<b>8.01</b>	<b>0.13</b>	<b>2%</b>

# Segment 1, SR 72/SR2 from SR4 to Possum Park Road, PM

Travel Time: Segment 1 - SR 72/Library Ave/SR 2 Capitol Trail from SR 4 to Possum Park Rd												
NB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Wyoming Rd	45	1.23	98.7	34.1	132.8	2.21	98.7	38.2	136.9	2.28	0.07	3%
College Square Shop. Ctr/Del. Ave	35	0.21	26.6	46.4	73.0	1.22	26.6	28.2	54.8	0.91	-0.31	-25%
SR 273/Main St	35	0.20	24.6	35.0	59.6	0.99	24.6	36.0	60.6	1.01	0.02	2%
Woodlawn Ave/E. Cleveland Ave	35	0.15	19.2	54.0	73.2	1.22	19.2	63.1	82.3	1.37	0.15	12%
Anna Way	35	0.60	61.8	5.9	67.7	1.13	61.8	5.6	67.4	1.12	-0.01	-1%
Possum Park Rd	35	0.45	46.4	46.3	92.7	1.55	46.4	24.2	70.6	1.18	-0.37	-24%
<b>Total:</b>		<b>2.84</b>	<b>277.3</b>	<b>221.7</b>	<b>499.0</b>	<b>8.32</b>	<b>277.3</b>	<b>195.3</b>	<b>472.6</b>	<b>7.88</b>	<b>-0.44</b>	<b>-5%</b>
SB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Anna Way	35	0.45	46.4	4.4	50.8	0.85	46.4	0.4	46.8	0.78	-0.07	-8%
E. Cleveland Ave/Woodlawn Ave	35	0.60	61.8	144.7	206.5	3.44	61.8	105.0	166.8	2.78	-0.66	-19%
Main St/SR 273	35	0.15	19.2	55.1	74.3	1.24	19.2	38.1	57.3	0.96	-0.28	-23%
Del. Ave/College Square Shop. Ctr	35	0.20	24.6	46.1	70.7	1.18	24.6	8.5	33.1	0.55	-0.63	-53%
Wyoming Rd	35	0.21	26.6	60.9	87.5	1.46	26.6	77.1	103.7	1.73	0.27	19%
SR 4	45	1.23	98.7	61.0	159.7	2.66	98.7	112.9	211.6	3.53	0.87	32%
<b>Total:</b>		<b>2.84</b>	<b>277.3</b>	<b>372.2</b>	<b>649.5</b>	<b>10.83</b>	<b>277.3</b>	<b>342.0</b>	<b>619.3</b>	<b>10.32</b>	<b>-0.51</b>	<b>-5%</b>



# Segment 2, SR 896 from Welsh Tract Rd to Cleveland Avenue, AM

## Travel Time: Segment 2 - SR 896 from Welsh Tract Rd to Cleveland Ave

NB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Signal				Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
			Running Time (sec)	Delay (sec)	Travel Time (sec)	Travel Time (min)						
Chestnut Hill Rd	35	0.25	29.8	27.1	56.9	0.95	29.8	24.3	54.1	0.90	-0.05	-5%
SR 4	35	0.19	22.5	25.0	47.5	0.79	22.5	49.8	72.3	1.21	0.41	52%
UD Fieldhouse Ent 1	35	0.17	23.9	6.5	30.4	0.51	23.9	3.4	27.3	0.46	-0.05	-10%
UD Fieldhouse Ent 2	35	0.11	18.1	4.4	22.5	0.38	18.1	11.0	29.1	0.49	0.11	29%
UD Ag Campus Ent	35	0.27	32.9	18.9	51.8	0.86	32.9	19.2	52.1	0.87	0.01	1%
East Park Pl	26	0.50	76.1	39.1	115.2	1.92	76.1	90.1	166.2	2.77	0.85	44%
Kent Way	25	0.31	47.5	9.6	57.1	0.95	47.5	8.6	56.1	0.94	-0.02	-2%
Amstel Ave	25	0.07	18.7	8.4	27.1	0.45	18.7	5.4	24.1	0.40	-0.05	-11%
Delaware Ave	25	0.11	23.9	59.3	83.2	1.39	23.9	54.0	77.9	1.30	-0.09	-6%
Main St	25	0.09	20.3	27.5	47.8	0.80	20.3	24.0	44.3	0.74	-0.06	-7%
N. College Ave	25	0.02	6.4	0.4	6.8	0.11	6.4	0.8	7.2	0.12	0.01	6%
E. Cleveland Ave	25	0.16	30.1	58.7	88.8	1.48	30.1	80.7	110.8	1.85	0.37	25%
<b>Total:</b>		<b>2.25</b>	<b>350.2</b>	<b>284.9</b>	<b>635.1</b>	<b>10.59</b>	<b>350.2</b>	<b>371.3</b>	<b>721.5</b>	<b>12.03</b>	<b>1.44</b>	<b>14%</b>

SB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Signal				Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
			Running Time (sec)	Delay (sec)	Travel Time (sec)	Travel Time (min)						
Nottingham Rd/W. Main St	25	0.10	22.7	68.2	90.9	1.52	22.7	40.6	63.3	1.06	-0.46	-30%
W. Main St to Elkton Rd to Delaware Ave**	25	0.20	46.0	0.0	46.0	0.77	46.0	0.0	46.0	0.77	0.00	0%
Orchard Rd	25	0.10	22.7	14.1	36.8	0.61	22.7	14.2	36.9	0.62	0.00	0%
S. College Ave	25	0.09	20.3	10.9	31.2	0.52	20.3	15.6	35.9	0.60	0.08	15%
Amstel Ave	25	0.11	23.9	8.5	32.4	0.54	23.9	5.3	29.2	0.49	-0.05	-10%
Kent Way	25	0.07	18.7	8.4	27.1	0.45	18.7	7.1	25.8	0.43	-0.02	-5%
West Park Pl	25	0.31	47.5	25.1	72.6	1.21	47.5	36.3	83.8	1.40	0.19	15%
Inspiration Blvd	25	0.50	76.1	6.7	82.8	1.38	76.1	13.3	89.4	1.49	0.11	8%
Discovery Blvd	35	0.27	32.9	4.0	36.9	0.62	32.9	8.4	41.3	0.69	0.07	12%
Marvin Dr	35	0.11	18.1	11.7	29.8	0.50	18.1	5.0	23.1	0.39	-0.11	-22%
SR 4	35	0.17	23.9	38.0	61.9	1.03	23.9	40.3	64.2	1.07	0.04	4%
Chestnut Hill Rd	35	0.19	22.5	16.8	39.3	0.66	22.5	29.2	51.7	0.86	0.21	32%
Welsh Tract Rd	35	0.25	29.8	23.6	53.4	0.89	29.8	27.9	57.7	0.96	0.07	8%
<b>Total:</b>		<b>2.47</b>	<b>405.1</b>	<b>236.0</b>	<b>641.1</b>	<b>10.69</b>	<b>405.1</b>	<b>243.2</b>	<b>648.3</b>	<b>10.81</b>	<b>0.12</b>	<b>1%</b>

# Segment 2, SR 896 from Welsh Tract Rd to Cleveland Avenue, PM

Travel Time: Segment 2 - SR 896 from Welsh Tract Rd to Cleveland Ave												
NB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Signal				Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
			Running Time (sec)	Delay (sec)	Travel Time (sec)	Travel Time (min)						
Chestnut Hill Rd	35	0.25	29.8	36.4	66.2	1.10	29.8	13.9	43.7	0.73	-0.38	-34%
SR 4	35	0.19	22.5	27.3	49.8	0.83	22.5	37.5	60.0	1.00	0.17	20%
UD Fieldhouse Ent 1	35	0.17	23.9	8.6	32.5	0.54	23.9	7.2	31.1	0.52	-0.02	-4%
UD Fieldhouse Ent 2	35	0.11	18.1	2.4	20.5	0.34	18.1	4.6	22.7	0.38	0.04	11%
UD Ag Campus Ent	35	0.27	32.9	24.0	56.9	0.95	32.9	30.0	62.9	1.05	0.10	11%
East Park Pl	26	0.50	76.1	34.2	110.3	1.84	76.1	130.2	206.3	3.44	1.60	87%
Kent Way	25	0.31	47.5	9.9	57.4	0.96	47.5	10.7	58.2	0.97	0.01	1%
Amstel Ave	25	0.07	18.7	10.4	29.1	0.49	18.7	13.3	32.0	0.53	0.05	10%
Delaware Ave	25	0.11	23.9	73.8	97.7	1.63	23.9	61.9	85.8	1.43	-0.20	-12%
Main St	25	0.09	20.3	30.0	50.3	0.84	20.3	22.5	42.8	0.71	-0.13	-15%
N. College Ave	25	0.02	6.4	0.4	6.8	0.11	6.4	1.2	7.6	0.13	0.01	12%
E. Cleveland Ave	25	0.16	30.1	179.1	209.2	3.49	30.1	66.9	97.0	1.62	-1.87	-54%
<b>Total:</b>		<b>2.25</b>	<b>350.2</b>	<b>436.5</b>	<b>786.7</b>	<b>13.11</b>	<b>350.2</b>	<b>399.9</b>	<b>750.1</b>	<b>12.50</b>	<b>-0.61</b>	<b>-5%</b>
SB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Signal				Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
			Running Time (sec)	Delay (sec)	Travel Time (sec)	Travel Time (min)						
Nottingham Rd/W. Main St	25	0.10	22.7	66.2	88.9	1.48	22.7	36.5	59.2	0.99	-0.50	-33%
W. Main St to Elkton Rd to Delaware Ave**	25	0.20	46.0	0.0	46.0	0.77	46.0	0.0	46.0	0.77	0.00	0%
Orchard Rd	25	0.10	22.7	16.9	39.6	0.66	22.7	16.9	39.6	0.66	0.00	0%
S. College Ave	25	0.09	20.3	12.9	33.2	0.55	20.3	23.8	44.1	0.74	0.18	33%
Amstel Ave	25	0.11	23.9	9.8	33.7	0.56	23.9	9.4	33.3	0.56	-0.01	-1%
Kent Way	25	0.07	18.7	11.4	30.1	0.50	18.7	9.1	27.8	0.46	-0.04	-8%
West Park Pl	25	0.31	47.5	36.1	83.6	1.39	47.5	44.0	91.5	1.53	0.13	9%
Inspiration Blvd	25	0.50	76.1	15.3	91.4	1.52	76.1	26.4	102.5	1.71	0.19	12%
Discovery Blvd	35	0.27	32.9	6.7	39.6	0.66	32.9	24.9	57.8	0.96	0.30	46%
Marvin Dr	35	0.11	18.1	14.5	32.6	0.54	18.1	6.9	25.0	0.42	-0.13	-23%
SR 4	35	0.17	23.9	64.6	88.5	1.48	23.9	96.8	120.7	2.01	0.54	36%
Chestnut Hill Rd	35	0.19	22.5	44.2	66.7	1.11	22.5	20.1	42.6	0.71	-0.40	-36%
Welsh Tract Rd	35	0.25	29.8	26.5	56.3	0.94	29.8	56.5	86.3	1.44	0.50	53%
<b>Total:</b>		<b>2.47</b>	<b>405.1</b>	<b>325.1</b>	<b>730.2</b>	<b>12.17</b>	<b>405.1</b>	<b>371.3</b>	<b>776.4</b>	<b>12.94</b>	<b>0.77</b>	<b>6%</b>

\* Data totals in purple are derived from manual calculations due to separate Synchro outputs being combined or the addition of manually calculated data for one or more segments.

\*\* Running Time, Travel Time, Arterial Speed and Arterial LOS for this combination of segments are not calculated in Synchro due to no signal controls and a free left turn. Running Time, Arterial Speed and Arterial LOS are based on the segment lengths in Synchro and then derived from calculations and tables provided in the HCM 2000 manual.

# Segment 3, SR 4 from Elkton Rd to Marrows Road, AM

## Travel Time: Segment 3 - SR 4 from Elkton Rd to Marrows Rd

EB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Science Blvd	50	1.07	77.2	27.3	104.7	1.75	77.2	2.4	79.6	1.33	-0.42	-24%
SR 896/S. College Ave	50	0.29	27.4	53.8	81.2	1.35	27.4	39.0	66.4	1.11	-0.25	-18%
SR 72	50	0.86	61.7	43.7	105.4	1.76	61.7	38.9	100.6	1.68	-0.08	-5%
Marrows Rd	50	0.49	38.4	39.3	77.7	1.30	38.4	20.9	59.3	0.99	-0.31	-24%
<b>Total:</b>		<b>2.71</b>	<b>204.7</b>	<b>164.1</b>	<b>369.0</b>	<b>6.15</b>	<b>204.7</b>	<b>101.2</b>	<b>305.9</b>	<b>5.10</b>	<b>-1.05</b>	<b>-17%</b>

  

WB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
SR 72	50	0.49	38.4	59.8	98.2	1.64	38.4	43.0	81.4	1.36	-0.28	-17%
S. College Ave/SR 896	50	0.86	61.7	46.3	108.0	1.80	61.7	43.6	105.3	1.76	-0.05	-3%
Science Blvd	50	0.29	27.4	19.8	47.2	0.79	27.4	12.5	39.9	0.67	-0.12	-15%
Elkton Rd	50	1.07	77.2	22.6	99.8	1.66	77.2	30.8	108	1.80	0.14	8%
<b>Total:</b>		<b>2.71</b>	<b>204.7</b>	<b>148.5</b>	<b>353.2</b>	<b>5.89</b>	<b>204.7</b>	<b>129.9</b>	<b>334.6</b>	<b>5.58</b>	<b>-0.31</b>	<b>-5%</b>



# Segment 3, SR 4 from Elkton Rd to Marrows Road, PM

Travel Time: Segment 3 - SR 4 from Elkton Rd to Marrows Rd												
EB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Science Blvd	50	1.07	77.2	25.1	102.3	1.71	77.2	4.4	81.6	1.36	-0.35	-20%
SR 896/S. College Ave	50	0.29	27.4	61.3	88.7	1.48	27.4	72.5	99.9	1.67	0.19	13%
SR 72	50	0.86	61.7	51.9	113.6	1.89	61.7	54.7	116.3	1.94	0.04	2%
Marrows Rd	50	0.49	38.4	68.8	107.2	1.79	38.4	11.3	49.7	0.83	-0.96	-54%
<b>Total:</b>		<b>2.71</b>	<b>204.7</b>	<b>207.1</b>	<b>411.8</b>	<b>6.86</b>	<b>204.7</b>	<b>142.9</b>	<b>347.6</b>	<b>5.79</b>	<b>-1.07</b>	<b>-16%</b>
WB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
SR 72	50	0.49	38.4	103.8	142.2	2.37	38.4	81.5	119.9	2.00	-0.37	-16%
S. College Ave/SR 896	50	0.86	61.7	48.1	109.8	1.83	61.7	62.4	124.0	2.07	0.24	13%
Science Blvd	50	0.29	27.4	22.1	49.5	0.83	27.4	15.3	42.7	0.71	-0.11	-14%
Elkton Rd	50	1.07	77.2	43.6	120.8	2.01	77.2	28.9	106.1	1.77	-0.25	-12%
<b>Total:</b>		<b>2.71</b>	<b>204.7</b>	<b>217.6</b>	<b>422.3</b>	<b>7.04</b>	<b>204.7</b>	<b>188.1</b>	<b>392.7</b>	<b>6.55</b>	<b>-0.49</b>	<b>-7%</b>



# Segment 4, SR 273 from Marrows Rd to Nottingham Road, AM

Travel Time: Segment 4 - SR 273/Main St/Nottingham Rd from Marrows Rd to Casho Mill Rd												
WB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
SR 2 Capitol Trail	35	0.21	25.0	43.7	68.7	1.15	25.0	47.6	72.6	1.21	0.06	6%
Tyre Ave	25	0.28	42.8	3.2	46.0	0.77	42.8	2.8	45.6	0.76	-0.01	-1%
Chapel Street	25	0.18	30.2	14.0	44.2	0.74	30.2	14.3	44.5	0.74	0.01	1%
Academy St	25	0.10	22.2	2.1	24.3	0.41	22.2	2.4	24.6	0.41	0.01	1%
S. College Ave	25	0.22	36.6	11.0	47.6	0.79	36.6	15.0	51.6	0.86	0.07	8%
N. College Ave	25	0.02	6.4	0.4	6.8	0.11	6.4	0.8	7.2	0.12	0.01	6%
Hillside Rd	25	0.16	42.1	45.5	87.6	1.46	42.1	37.5	79.6	1.33	-0.13	-9%
Casho Mill Rd	30	0.98	125.5	17.3	142.8	2.38	125.5	9.1	134.6	2.24	-0.14	-6%
<b>Total:</b>		<b>2.15</b>	<b>330.8</b>	<b>137.2</b>	<b>468.0</b>	<b>7.80</b>	<b>330.8</b>	<b>129.5</b>	<b>460.3</b>	<b>7.67</b>	<b>-0.13</b>	<b>-2%</b>
EB AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Hillside Rd	30	0.98	47.6	31.9	79.5	1.33	47.6	34.8	82.4	1.37	0.05	4%
Nottingham Rd to Elkton Rd to Delaware Ave**	25	0.20	50.6	0.0	50.6	0.84	50.6	0.0	50.6	0.84	0.00	0%
Orchard Rd	25	0.10	22.7	14.1	36.8	0.61	22.7	14.2	36.9	0.62	0.00	0%
S. College Ave NB SB	25	0.09	20.3	10.9	31.2	0.52	20.3	15.6	35.9	0.60	0.08	15%
Academy Street	25	0.22	36.5	12.5	49.0	0.82	36.5	9.3	45.8	0.76	-0.05	-7%
Chapel Street	25	0.22	36.9	14.5	51.4	0.86	36.9	19.0	55.9	0.93	0.08	9%
Tyre Ave	25	0.23	35.7	5.4	41.1	0.69	35.7	25.7	61.4	1.02	0.34	49%
SR 72 Library Ave	25	0.29	44.0	55.7	99.7	1.66	44.0	41.4	85.4	1.42	-0.24	-14%
SR 273/Main St	35	0.20	23.6	36.6	60.2	1.00	23.6	27.7	51.3	0.86	-0.15	-15%
Marrows Rd	35	0.21	25.0	40.0	65.0	1.08	25.0	12.1	37.1	0.62	-0.47	-43%
<b>Total:</b>		<b>2.74</b>	<b>342.9</b>	<b>221.6</b>	<b>564.5</b>	<b>9.41</b>	<b>342.9</b>	<b>199.8</b>	<b>542.7</b>	<b>9.05</b>	<b>-0.36</b>	<b>-4%</b>

# Segment 4, SR 273 from Marrows Rd to Nottingham Road, PM

Travel Time: Segment 4 - SR 273/Main St/Nottingham Rd from Marrows Rd to Casho Mill Rd

WB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed	Dist	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel	Travel
	Limit (mph)	(mi)									Time (min)	Time (min)
SR 2 Capitol Trail	35	0.21	25.0	53.5	79.3	1.32	25.0	45.3	70.5	1.18	-0.15	-11%
Tyre Ave	25	0.28	42.8	4.7	47.5	0.79	42.8	4.0	46.8	0.78	-0.01	-1%
Chapel Street	25	0.18	30.2	16.6	46.8	0.78	30.2	30.8	61.0	1.02	0.24	30%
Academy St	25	0.10	22.2	6.2	28.4	0.47	22.2	13.3	35.5	0.59	0.12	25%
S. College Ave	25	0.22	36.6	18.1	54.7	0.91	36.6	19.5	56.1	0.94	0.02	3%
N. College Ave	25	0.02	6.4	0.4	6.8	0.11	6.4	1.2	7.6	0.13	0.01	12%
Hillside Rd	25	0.12	42.1	63.1	105.2	1.75	42.1	51.4	93.5	1.56	-0.20	-11%
Casho Mill Rd	30	0.98	125.5	22.5	148.0	2.47	125.5	43.8	169.3	2.82	0.36	14%
<b>Total:</b>		<b>2.11</b>	<b>330.8</b>	<b>185.1</b>	<b>516.7</b>	<b>8.61</b>	<b>330.8</b>	<b>209.3</b>	<b>540.3</b>	<b>9.01</b>	<b>0.39</b>	<b>5%</b>

  

EB PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed	Dist	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel	Travel
	Limit (mph)	(mi)									Time (min)	Time (min)
Hillside Rd	30	0.98	47.7	38.6	86.3	1.44	47.6	38.8	86.4	1.44	0.00	0%
Nottingham Rd to Elkton Rd to Delaware Ave**	25	0.20	50.6	0.0	50.6	0.84	50.6	0.0	50.6	0.84	0.00	0%
Orchard Rd	25	0.10	22.7	16.9	39.6	0.66	22.7	16.9	39.6	0.66	0.00	0%
S College Ave NB SB	25	0.09	20.3	12.9	33.2	0.55	20.3	23.8	44.1	0.74	0.18	33%
Academy Street	25	0.22	36.5	18.1	54.6	0.91	36.5	10.5	47.0	0.78	-0.13	-14%
Chapel Street	25	0.22	36.9	17.0	53.9	0.90	36.9	29.9	66.8	1.11	0.22	24%
Tyre Ave	25	0.23	35.7	4.5	40.2	0.67	35.7	3.9	39.6	0.66	-0.01	-1%
SR 72 Library Ave	25	0.29	44.0	67.8	111.8	1.86	44.0	68.4	112.4	1.87	0.01	1%
SR 273/Main St	35	0.20	23.6	35.0	58.6	0.98	23.6	36.0	59.6	0.99	0.02	2%
Marrows Rd	35	0.21	25.0	30.5	56.3	0.94	25.0	28.0	53.2	0.89	-0.05	-6%
<b>Total:</b>		<b>2.74</b>	<b>343.0</b>	<b>241.3</b>	<b>585.1</b>	<b>9.75</b>	<b>342.9</b>	<b>256.2</b>	<b>599.3</b>	<b>9.99</b>	<b>0.24</b>	<b>2%</b>

\* Data totals in purple are derived from manual calculations due to separate Synchro outputs being combined or the addition of manually calculated data for one or more segments.

\*\* Running Time, Travel Time, Arterial Speed and Arterial LOS for this combination of segments are not calculated in Synchro due to no signal controls and a free left turn. Running Time, Arterial Speed and Arterial LOS are based on the segment lengths in Synchro and then derived from calculations and tables provided in the HCM 2000 manual.

# Segment 5, Elkton Rd from Otts Chapel Rd to Amstel Ave, AM

Travel Time: Segment 5 - Elkton Rd from Otts Chapel Rd to Amstel Ave												
NE AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Interchange Blvd	50	0.23	22.6	18.9	41.5	0.69	22.6	7.9	30.5	0.51	-0.18	-27%
SR 4 #3	50	0.38	32.7	51.3	84.0	1.40	32.7	29.3	62.0	1.03	-0.37	-26%
Casho Mill Rd	40	0.43	40.5	4.7	45.2	0.75	40.5	25.1	65.6	1.09	0.34	45%
Short Ln	40	0.27	29.9	10.4	40.3	0.67	29.9	2.6	32.5	0.54	-0.13	-19%
W Park Place	40	0.13	14.6	14.9	29.5	0.49	14.6	1.8	16.4	0.27	-0.22	-44%
Veterans Dr	30	0.18	23.0	9.6	32.6	0.54	23.0	1.8	24.8	0.41	-0.13	-24%
Apple Rd	30	0.08	10.7	17.2	27.9	0.47	10.7	15.9	26.6	0.44	-0.02	-5%
Amstel Ave	28	0.31	39.9	4.2	44.1	0.74	39.9	2	41.7	0.70	-0.04	-5%
<b>Total:</b>	<b>2.01</b>		<b>213.9</b>	<b>131.2</b>	<b>345.1</b>	<b>5.75</b>	<b>213.9</b>	<b>86.4</b>	<b>300.3</b>	<b>5.00</b>	<b>-0.75</b>	<b>-13%</b>
SW AM 7 to 9 AM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Apple Rd	28	0.31	39.9	37.3	77.2	1.29	39.9	29.4	69.1	1.15	-0.14	-10%
Veterans Dr	30	0.08	10.7	2.9	13.6	0.23	10.7	2.1	12.8	0.21	-0.01	-6%
W Park Place	30	0.18	23.0	5.6	28.6	0.48	23.0	1.4	24.4	0.41	-0.07	-15%
Thorn Ln	30	0.13	17.0	11.8	28.8	0.48	17.0	2.5	19.5	0.33	-0.16	-32%
Casho Mill Rd	40	0.27	29.9	23.9	53.8	0.90	29.9	45.7	75.6	1.26	0.36	41%
Suburban Plaza Dr	40	0.43	40.5	34.8	75.3	1.26	40.5	21.5	62.0	1.03	-0.22	-18%
Interchange Blvd	50	0.38	32.7	17.7	50.4	0.84	32.7	2.9	35.6	0.59	-0.25	-29%
Otts Chapel Rd	50	0.23	22.6	26.1	48.7	0.81	22.6	12	34.6	0.58	-0.24	-29%
<b>Total:</b>	<b>2.01</b>		<b>216.3</b>	<b>160.1</b>	<b>376.4</b>	<b>6.27</b>	<b>216.3</b>	<b>117.5</b>	<b>333.6</b>	<b>5.56</b>	<b>-0.71</b>	<b>-11%</b>



# Segment 5, Elkton Rd from Otts Chapel Rd to Amstel Ave, PM

## Travel Time: Segment 5 - Elkton Rd from Otts Chapel Rd to Amstel Ave

NE PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Interchange Blvd	50	0.23	22.6	20.9	43.5	0.73	22.6	18.9	41.5	0.69	-0.03	-5%
SR 4 #3	50	0.38	32.7	41.9	74.6	1.24	32.7	51.3	84.0	1.40	0.16	13%
Casho Mill Rd	40	0.43	40.5	1.4	41.9	0.70	40.5	4.7	45.2	0.75	0.06	8%
Short Ln	40	0.27	29.9	10.8	40.7	0.68	29.9	10.4	40.3	0.67	-0.01	-1%
W Park Place	40	0.13	14.6	13.6	28.2	0.47	14.6	14.9	29.5	0.49	0.02	5%
Veterans Dr	30	0.18	23.0	2.2	25.2	0.42	23.0	9.6	32.6	0.54	0.12	29%
Apple Rd	30	0.08	10.7	17.5	28.2	0.47	10.7	17.2	27.9	0.47	-0.01	-1%
Amstel Ave	28	0.31	39.9	5.0	44.9	0.75	39.9	4.2	44.1	0.74	-0.01	-2%
<b>Total:</b>	<b>2.01</b>		<b>213.9</b>	<b>113.3</b>	<b>327.2</b>	<b>5.45</b>	<b>213.9</b>	<b>131.2</b>	<b>345.1</b>	<b>5.75</b>	<b>0.30</b>	<b>5%</b>

  

SW PM 4 to 6 PM			Existing Conditions				Future Conditions with Signal Optimization				Change in	% Change in
Cross Street, Traffic Signal Location	Speed Limit (mph)	Dist (mi)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Running Time (sec)	Signal Delay (sec)	Travel Time (sec)	Travel Time (min)	Travel Time (min)	Travel Time (min)
Apple Rd	28	0.31	39.9	36.4	76.3	1.27	39.9	37.3	77.2	1.29	0.01	1%
Veterans Dr	30	0.08	10.7	2.5	13.2	0.22	10.7	2.9	13.6	0.23	0.01	3%
W Park Place	30	0.18	23.0	14.2	37.2	0.62	23.0	5.6	28.6	0.48	-0.14	-23%
Thorn Ln	30	0.13	17.0	11.8	28.8	0.48	17.0	11.8	28.8	0.48	0.00	0%
Casho Mill Rd	40	0.27	29.9	12.2	42.1	0.70	29.9	23.9	53.8	0.90	0.20	28%
Suburban Plaza Dr	40	0.43	40.5	26.3	66.8	1.11	40.5	34.8	75.3	1.26	0.14	13%
Interchange Blvd	50	0.38	32.7	19.8	52.5	0.88	32.7	17.7	50.4	0.84	-0.04	-4%
Otts Chapel Rd	50	0.23	22.6	32.4	55.0	0.92	22.6	26.1	48.7	0.81	-0.11	-11%
<b>Total:</b>	<b>2.01</b>		<b>216.3</b>	<b>155.6</b>	<b>371.9</b>	<b>6.20</b>	<b>216.3</b>	<b>160.1</b>	<b>376.4</b>	<b>6.27</b>	<b>0.07</b>	<b>1%</b>





# Service Standards

- ◎ DeIDOT Recommendation: Capacity-related service standard of a maximum increase in travel time per link and per segment of 10%.



# Questions?

- ◎ Please contact:

- Sarah Coakley, AICP  
Sarah.coakley@delaware.gov  
(302) 760-2236

Thank you!

