Appendix A

Benefit Cost Analysis

Walkable Olean

North Union Complete Street Transformation

Olean, New York

TIGER5 – FY13

CFDA 20.933

Prepared by the City of Olean, New York

June 3, 2013

Benefit Cost Analysis for

North Union Street, Olean, NY

Executive Summary

This analysis reports the benefits and costs of the North Union Street Transformation Project. A conservative analysis shows that in present value dollars, the project has over $11 million in benefits compared to $8 million in costs, for a Benefit-Cost ratio of 139%. The following benefits and costs are considered:

Benefits

- Travel Time Savings – vehicles will spend less time at signalized intersections, allowing shorter travel time through the North Union Street corridor.
- Reduced Vehicle Emissions- reduced travel time results in less greenhouse gas emissions.
- Fuel Savings- Reduced delays at intersections results in less fuel used per trip.
- Safety- Replacing signalized intersections with modern roundabouts, improving pedestrian facilities, and reducing the number of lanes will result in fewer crashes and injuries.
- Property Values- resulting economic growth will increase property values creating increased tax revenue for the City.
- Energy Efficiency- removal of traffic signals and installation of new energy efficient street lights reduces electricity usage.
- Environmental Sustainability – planting trees will absorb carbon dioxide, contributing to cleaner air.

The following benefits will also accrue from the project, but are not included in the quantitative analysis:

- Public Health- Improved sidewalks and the addition of bicycle lanes will encourage active transportation, which results in a healthier lifestyle and reduced healthcare costs. These benefits contribute to the increased value of property.
- Business Creation- An attractive complete street with improved landscaping and increased pedestrian traffic will attract and sustain new businesses; creating jobs and boosting the local economy.
- Employee Attraction and Retention- The project will make Olean a destination of choice for young professionals, allowing businesses to attract and retain highly qualified employees.
- Community Cohesion- A new and improved public space designed for greater pedestrian mobility and safety will be a point of pride for decades to come.

Costs

- Initial Capital Cost – The total cost for the project, including design fees, utility replacements, and streetscape amenities.
- Landscape Upkeep – This includes annual cost of maintaining landscaped median and trees.
- Road Maintenance – This includes regular maintenance for pavement, striping, and sidewalks.

Benefit Cost Matrix						
Current Status/Baseline & Problem to be Addressed	Change to Baseline/ Alternatives	Type of Impacts	Population Affected by Impacts	Annual Economic Benefit	Summary of Results Over 20 Years	Page Reference in BCA
Delay time over 7 traffic signals	Replace 7 traffic signals with 5 roundabouts	Reduce wait time of vehicles during peak traffic hours	900 drivers during both morning and evening	$139,700	$2,794,000	Page 7
		Reduce fuel used while delayed at traffic signals	900 drivers during both morning and evening	$15,122	$302,440	Page 8
		Reduce greenhouse gas emissions	14,363 residents of Olean with cleaner air to breathe	≈$1	≈$20	Page 9
High Accident Rate	Replace 7 signalized intersections with 5 modern roundabouts, reduce travel lanes, bike/ped accommodations	Reduce intersection crashes	11,000 daily drivers plus non-motorized users.	$520,737	$10,414,740	Page 10
Stagnant/declining economic growth and property values	Complete Street with landscaping and amenities to promote walkability.	Increase property values of surrounding area.	Business and home owners in surrounding areas.	$4,834,640	$4,8343,640	Page 12
Inefficient energy and sustainability practices	Replace signals with roundabouts, new energy efficient street lighting, plant 84 trees	Lower energy costs for the city.	All residents of Olean.	$40,657	$813,140	Page 15
		Air quality benefits from trees		$83,748	$1,674,960	Page 16

Benefit-Cost Analysis

State of Good Repair:

The construction of the new roadway using modern techniques will minimize freeze-thaw damage, eliminate standing water problems, and reduce annual maintenance costs. The replacement of underground utilities (water and sewer lines) will eliminate the need to open the road for repairs, which further accelerates deterioration. The existing traffic signal poles and street light poles are well-beyond their expected life, and require regular maintenance. The traffic signal poles will be completely eliminated, and the street lights will be replaced. The center median will reduce overall pavement width, reducing maintenance costs less by requiring less asphalt. Benefits of State of good repair are included in environmental sustainability.

Economic Competitiveness:

Time and Fuel Savings

The replacement of the seven traffic signals along North Union Street with five roundabouts will have a noticeable impact on reducing delay and saving fuel. A trip through the corridor currently will experience 65-75 seconds of signal delay in the morning peak hour, and about 80 seconds of delay in the evening. In contrast, the roundabouts would create only about 42-49 seconds of delay in the morning and 45 seconds in the evening. This translates to a savings of 11,176 hours as well as $139,698 of monetized travel time annually. In addition, the time savings also allows for approximately 4,053 gallons of gas to be saved per year, which translates to $15,122 back into the pockets of car drivers each year. These benefits are for the approximately 20% of daily vehicles using North Main Street during the morning and evening peak hour. Additional travel time and fuel benefits will also be realized for the remaining 80% of vehicles.

Higher Quality and More Dedicated Workers

Olean is the business, financial, transportation, and entertainment center of Cattaraugus County. While it still has much to offer its residents, its population has been decreasing since the 1950's and businesses have been closing on North Union Street. With a new, visually appealing complete street in the center of the city, many of the major employers such as Olean General Hospital, CUTCO Cutlery, Dresser Rand, and the ReHabilitation center will be able to better compete with employers all over the country for the best and brightest employees. This project will clearly make Olean a more desirable place to start a career, start a family, and live one's life.

Property Values and Tax Revenues

A transformed North Union Street will attract more traffic of all types, especially pedestrian traffic. Many studies across the country have shown a direct connection between walkable and bicycle friendly spaces and property values. A study in North Carolina found that property

values near walkable areas were about 12% higher than areas with little or no walkability. In addition, a study in Indiana showed that property values near bike paths were about 11% higher. Another example of rising property values took place in a similar project carried out in nearby Hamburg, NY. This project resulted in a 169% increase in property sale values along their main street. This rise in property values will lead to greater tax revenue from the area. More pedestrian traffic will also help to improve the businesses that are already along North Union Street and will attract new businesses, thus creating new jobs for the community.

The assessed value of all properties in the North Union Street corridor is over $48 million. It is assumed that properties values will increase at least 10% as a result of the North Union Street Transformation, resulting in a one-time benefit of $4,800,000. Since this will happen gradually after the project is finished, the benefit is realized at 2%/year for 5 years.

Livability:

Creating a Progressive City and Community Pride

Current trends in urban planning are leaning towards creating "greener," healthier, more sustainable, and people friendly cities. This project will clearly put Olean on its way towards encompassing all of these virtues, helping it become a city that can be ready for and embrace all that the future has to offer. The North Union Street Transformation will contribute towards making Olean a more sustainable, energy efficient, eco-friendly, healthy, safe, and business friendly place to visit and call home. With a revamped and revitalized "main" street, the people of Olean will collectively be able to identify with the values that Olean promotes and take pride in their progressive yet modest and unpretentious city.

Improving Public Health

The current roadway design causes delay and frustration due to idling at traffic signals. By decreasing the amount of time it takes to drive down North Union Street with roundabouts, approximately 0.1 metric tons per year of carbon dioxide and other harmful greenhouse gases will be saved from being spewed into the air annually. Again, this benefit is only from the 20% of vehicles using North Union Street during peak hours. While it may seem small, any reduction in greenhouse gases is important in the effort to address global climate change. The introduction of bike lanes will not only serve to make bicyclists safer, but will also encourage more cycling, thus promoting healthy activity in the community, economic benefits for business that capitalize on bicycle use, and a reduction in car usage. While increased bicycle usage does not have a quantifiable benefit due to its subjective nature, its impact cannot be overlooked.

Environmental Sustainability:

Increased Sustainability and Energy Efficiency

North Union Street has a combined storm water system, requiring the unnecessary treatment of millions of gallons of water each year that could be recycled to the earth through green storm water infrastructure. The North Union Street Transformation will utilize landscaping and trees to naturally treat storm water and reduce the inflow of storm water. In addition, the removal traffic signals for roundabouts saves an estimated $5,000 per year per roundabout and the replacement of the current street lighting with energy efficient street lights saves approximately $5,500 per year (http://www.nevadadot.com/safety/roundabout/benefits.aspx) (http://www.mississauga.ca/file/COM/LEDBackgrounder.pdf). Other sustainability benefits include reduced fuel usage and greenhouse gases (already discussed) and the air quality benefits of tree plantings, estimated to be worth $997 per tree per year. (10% of estimate used in City of Buffalo TIGER application)

Safety:

Reduces crashes and Injuries

Crash data for North Union Street shows an accident rate of 13.48 accidents per million vehicle miles (MVM) of travel. This is far above the New York State average rate of 2.92 accidents/mvm for a similar facility. Studies in the United States and Europe have shown that roundabouts help to reduce all crashes by 48%, injury crashes by 75%, fatality crashes by 90%, and pedestrian crashes by 40% .(http://www.wsdot.wa.gov/Safety/roundabouts/benefits.htm)

Furthermore, by reducing the number of lanes from 4 to 2, decreasing the width of the lanes, and adding a median, drivers will travel more slowly and carefully, reducing the accident rate by 15% and making it much more safe and accessible for pedestrians.

Annualized Benefits and Costs					
Project Year	Expected Yearly Cost (1)	Expected Yearly Benefit (2)	Discount Factors for 7%	Present Value of Costs	Present Value of Benefits
2013					
2014	$4,425,000		0.9346	$4,135,605	$0
2015	$4,425,000	$1,766,890	0.8734	$3,864,795	$1,543,202
2016	$5,000	$1,766,890	0.8163	$4,082	$1,442,312
2017	$5,000	$1,766,890	0.7629	$3,815	$1,347,960
2018	$25,000	$1,766,890	0.713	$17,825	$1,259,793
2019	$5,000	$1,766,890	0.6663	$3,332	$1,177,279
2020	$5,000	$799,962	0.6227	$3,114	$498,136
2021	$5,000	$799,962	0.582	$2,910	$465,578
2022	$25,000	$799,962	0.5439	$13,598	$435,099
2023	$5,000	$799,962	0.5083	$2,542	$406,621
2024	$320,000	$799,962	0.4751	$152,032	$380,062
2025	$5,000	$799,962	0.444	$2,220	$355,183
2026	$25,000	$799,962	0.415	$10,375	$331,984
2027	$5,000	$799,962	0.3878	$1,939	$310,225
2028	$5,000	$799,962	0.3624	$1,812	$289,906
2029	$5,000	$799,962	0.3387	$1,694	$270,947
2030	$25,000	$799,962	0.3166	$7,915	$253,268
2031	$5,000	$799,962	0.2959	$1,480	$236,709
2032	$5,000	$799,962	0.2765	$1,383	$221,189
2033	$5,000	$799,962	0.2584	$1,292	$206,710
	$9,335,000	$20,033,918		$8,233,756	$11,432,164

Costs:

Annual landscaping at $5,000/year
New pavement markings every 4 years at $20,000 per application
Mill and overlay at year 10; $315,000

Benefits:

Travel time savings (AM and PM peak hour)	$139,698/year
Fuel savings (AM and PM peak hour)	$15,122/year
Crash savings	$520,737/year
Energy Savings	$40,657/year
Sustainability benefits	$83,748/year
Property Value Increase	$4,834,640 total

CALCULATIONS FOR TRAVEL TIME SAVINGS

Delay Time:

Average passenger per car = 1.92
(http://www1.eere.energy.gov/vehiclesandfuels/facts/2010_fotw613.html)

	Vehicle Travel Time and Delay Between Main and State Street				
Existing		AM		PM	
	Direction	Travel Time	Delay at Signals (Cars)	Travel Time	Delay at Signals (Cars)
	Northbound	183.1	74.8 (350)	189.7	81.4 (550)
	Southbound	173.6	65.3 (400)	188.5	80.2 (550)
Proposed		AM		PM	
	Direction	Travel Time	Delay at Roundabouts (Cars)	Travel Time	Delay at Roundabouts (Cars)
	Northbound	115.7	42.2 (350)	152.34	45.7 (550)
	Southbound	129.42	49.3 (400)	163.46	43.9 (550)

Days in a Year = 365

Current Annual Delay Time = 1.92 * 365 * (400 * 65.3 + 550 * 80.2 + 350 * 74.8 + 550 * 81.4) * (1/3600) = 27,483 hours / year

Post Project Annual Delay Time = 1.92 * 365 * (400 * 49.3 + 550 * 43.9 + 350 * 42.2 + 550 * 45.7) * (1/3600) = 16,307.2 hours / year

Delay Time Monetary Value:

Value of Travel Time (All Purposes) = $12.50
(http://www.dot.gov/sites/dot.dev/files/docs/BCA_OnlineSupplement_May22_2013.pdf)

Current Delay Time Monetary Value Lost = 27,483 * 12.50 = $343,538 / year

Post Project Delay Time Monetary Value Lost = 16,307.2 * 12.50 = $203,840 / year

CALCULATIONS FOR FUEL SAVINGS

Fuel Savings:

Average MPH with Signals = 19

Average MPH with roundabouts = 22

MPG for Average Vehicle = 21
(http://www.epa.gov/otaq/climate/documents/420f11041.pdf)

Current Fuel Used = (19 / 21) * 365 * (400 * 65.3 + 550 * 80.2 + 350 * 74.8 + 550 * 81.4) * (1/3600) = 12,950.8 gallons / year

Post Project Fuel Used = (22 / 21) * 365 * (400 * 49.3 + 550 * 43.9 + 350 * 42.2 + 550 * 45.7) * (1/3600) = 8,897.79 gallons / year

Fuel Savings Monetary Value:

NYS Average Gas Price = $3.731

Current Fuel Monetary Value = 12,950.8 * 3.731 = $48,319 / year

Post Project Fuel Monetary Value = 8,897.79 * 3.731 = $33,197 / year

CALCULATIONS FOR GHG REDUCTION

Vehicle CO_2 and Greenhouse Gas Emissions (Pollution):

CO_2 Emissions per Mile for Average Car = 423g
(http://www.epa.gov/otaq/climate/documents/420f11041.pdf)

Length of Road Section = 0.6 miles

Current Vehicle Emissions = 423 * (1metric ton / 1,000,000g) * 0.6 * (400 * 65.3 + 550 * 80.2 + 350 * 74.8 + 550 * 81.4) * (1day / 84,600sec) * 365 = 0.155 metric tons / year

Post Project Vehicle Emissions = 423 * (1metric ton / 1,000,000g) * 0.6 * (400 * 49.3 + 550 * 43.9 + 350 * 42.2 + 550 * 45.7) * (1day / 84,600sec) * 365 = 0.0917 metric tons / year

CALCULATIONS FOR CRASH REDUCTIONS

Savings from Property Damage Only (PDO)

Monetized Value of PDO = $3,206 per vehicle

Vehicles Affected by PDOs at Intersections Annually = 28.6

Vehicles Affected by PDOs on Street Annually = 20.8

Reduction Percentage of PDO's with Roundabouts = 48%

Reduction Percentage of PDO's with Raised Medians = 15%

Current Monetized Waste due to PDO's = $3,206 * (28.6 + 20.8) = $158,376

Post Project Monetized Waste due to PDO's = $3,206 * (28.6 * 0.52 + 20.8 * .85)

= $104,362

Savings = $158,376 - $104,362 = $54,014

Savings from Injuries

Class C (Possible Injuries) Annually at Intersections (on Street) = 4.2 (5.22)

Class B (Non-Incapacitating Injuries) Annually at Intersections (on Street) = 2 (2.375)

Injury Reduction Percentage with Roundabouts = 75%

Injury Reduction Percentage with Raised Median = 15%

Current Monetized Value of Injuries at Intersections					
AIS (I)	Monetized Value of Injuries (II)	Multiply-ing Factor Class C (III)	Monetized Value of Class C Injuries (II) * (III) * (4.4)	Multiply-ing Factor Class B (V)	Monetized Value of Class B Injuries (I) * (V) * (2)
0 (None)	$0	0.23437	$0	0.08347	$0
1 (Minor)	$27,300	0.68946	$82,817.90	0.76843	$41,956.20
2 (Moderate)	$427,700	0.06391	$120,271.00	0.10898	$93,221.4
3 (Serious)	$955,500	0.01071	$45,027.00	0.03191	$60,980.00
4 (Severe)	$2,420,600	0.00142	$15,123.90	0.00620	$30,015.40
5 (Critical)	$5,396,300	0.00013	$3,086.68	0.00101	$10,900.5
		Sum	$266,326		$237,074

(http://www.dot.gov/sites/dot.dev/files/docs/BCA_OnlineSupplement_May22_2013.pdf)

Current Monetized Value of Injuries on Street					
AIS (I)	Monetized Value of Injuries (II)	Multiply-ing Factor Class C (III)	Monetized Value of Class C Injuries (II) * (III) * (5.22)	Multiply-ing Factor Class B (V)	Monetized Value of Class B Injuries (I) * (V) * (2.375)
0 (None)	$0	0.23437	$0	0.08347	$0
1 (Minor)	$27,300	0.68946	$98,252.20	0.76843	$49,823.10
2 (Moderate)	$427,700	0.06391	$142,685.00	0.10898	$110,701.00
3 (Serious)	$955,500	0.01071	$53,418.40	0.03191	$72,413.80
4 (Severe)	$2,420,600	0.00142	$14,942.50	0.00620	$35,643.30
5 (Critical)	$5,396,300	0.00013	$3,661.93	0.00101	$12,944.40
		Sum	$312,960		$281,526

Current Monetized Waste due to Injuries = $266,326 + $237,074 + $312,960 + 281,526 = $1,097,866

Post Project Monetized Waste due to Injuries = ($266,326 + $237,074) * .25 + ($312,960 + 281,526) * .85 = $631,163

Savings = $1,097,866 - $631,163 = $466,723/year

Accident Statistics at Intersections					
Year	Total Accidents	Injuries	PDOs	Non-Reportable	Pedestrian/Bike Accidents
2008	26	7	43	4	1
2009	18	10	23	4	2
2010	17	3	17	7	2
2011	23	8	28	9	1
2012	16	3	32	1	0
Totals	100	31	143	25	6

Types of Accidents									
Year	Right Turn	Left Turn	Backing Up	Rear End	Changing Lanes	Sideswipe	Ped/Bike	Unknown	Total
2008	2	11	1	14	2	2	3	4	39
2009	2	11	5	17	6	3	3	1	48
2010	4	9	3	12	3	2	3	1	37
2011	2	6	6	12	5	1	1	3	36
2012	1	6	2	7	2	0	4	4	26
Totals	11	43	17	62	18	8	14	13	186

Accident Location Information System (ALIS) Olean

CALCULATIONS FOR PROPERTY VALUE

Total Assessed Value of Properties on N. Union = $48,346,404

Estimated Property Value Increase = 10%

Post Project Total Assessed Value of Properties on N. Union = $48,346,404 * 1.10 = $53,181,044

Monetary Benefit = $53,181,044 - $48,346,404 = $4,834,640

List of Properties and Their Assessed Value
Provided By the City of Olean

Primary Owner	Property Address		Prop Class	Land AV	Total AV
Olean Urban Renewal Agency	101	Union St N	464	$17,500	$240,000
Olean Urban Renewal Agency	107	Union St N	481	$8,800	$42,200
BK-Properties Inc	109	Union St N	481	$5,300	$69,000
Dicola Craig	111	Union St N	481	$8,800	$77,000
Zachanoti LLC	115	Union St N	481	$6,400	$47,000
Suiter, Roy N	117	Union St N	481	$9,500	$72,000
Vena, Victor A	119	Union St N	481	$9,900	$175,000
Herbst, Lawrence C	121	Union St N	481	$21,800	$131,000
Masonic Temple	124	Union St N	481	$13,500	$350,000
First Tier Bank & Trust	125	Union St N	481	$8,000	$76,000
Dwaileebe, John	126	Union St N	481	$900	$40,000
First Tier Bank & Trust	127	Union St N	481	$8,000	$75,000
First Tier Bank & Trust	129	Union St N	461	$110,000	$575,000
City Of Olean Housing Auth	132	Union St N	411	$24,000	$2,060,000
City Of Olean Housing Auth	132	Union St N	481	$70,000	$418,500
Park Centre Development Inc	133	Union St N	422	$9,500	$130,000
Park Centre Development Inc	135	Union St N	452	$190,000	$900,000
City Of Olean Housing Auth	136	Union St N	481	$12,000	$110,000
City of Olean Housing Auth	140	Union St N	481	$14,000	$70,000
Beef 'N Barrel Inc	146	Union St N	481	$35,000	$625,000
Win-Olean Property Assoc. LLC	150	Union St N	481	$10,700	$375,000
Southern Tier Realty Co	154	Union St N	481	$7,100	$125,000
Klein, Terry C	158	Union St N	481	$4,000	$94,000
Rigas, Doris	160	Union St N	481	$6,600	$178,500
Park Centre Development Inc	164-66	Union St N	481	$7,500	$106,700
Wellsville Medical Arts LLC	168-70	Union St N	481	$11,400	$240,000
Palmquist, Stephen Y	172	Union St N	481	$2,800	$67,400
Park Centre Development Inc	174	Union St N	481	$6,100	$190,000
Park Centre Development Inc	175	Union St N	464	$69,000	$750,000
VanScoter, Ronald	176	Union St N	481	$13,200	$324,000
VanScoter, Ronald D	182	Union St N	481	$1,500	$27,000

Dwaileebe, John J Jr	184	Union St N	481	$3,000	$110,400
Higgins Enterprises, LLC	186	Union St N	481	$3,500	$85,000
Warren, Charles E	188	Union St N	481	$3,500	$140,000
Community Bank, NA	201	Union St N	463	$26,800	$1,790,000
Community Bank, NA	207	Union St N	461	$23,300	$205,000
Community Bank, NA	209	Union St N	481	$22,100	$205,000
Whitehead, Blaine W	211	Union St N	481	$23,300	$95,000
Four T Development, Inc.	213	Union St N	481	$24,900	$130,000
Bordonaro, Jos.c.	217	Union St N	481	$10,900	$66,800
Park Centre Development Inc	219	Union St N	330	$3,500	$3,500
Park Centre Development Inc	221-25	Union St N	330	$9,600	$9,600
Bordonaro, Jos.c.	223R	Union St N	330	$7,100	$7,100
Park Centre Development Inc	226	Union St N	433	$14,400	$263,300
LaBella of Olean, LLC	228-30	Union St N	481	$900	$135,000
B. Wright Properties, LLC	229-31	Union St N	481	$18,000	$100,000
Community Bank, NA	229R	Union St N	330	$3,800	$3,800
B. Wright Properties, LLC	233-37	Union St N	481	$35,900	$50,000
Parent Education Program, Inc.	234-42	Union St N	481	$24,200	$315,300
Senfield Brothers Inc	239	Union St N	481	$40,000	$215,000
Douthit, Stephen J	241	Union St N	481	$1,200	$35,000
Jamestown Comm. College Region	260	Union St N	613	$536,000	$15,000,000
Inland Western New York	265	Union St N	453	$13,700	$1,760,600
Inland Western New York	269	Union St N	330	$20,000	$20,000
Olean Business Institute	301-05	Union St N	615	$9,600	$270,000
Black, Beverly E	307	Union St N	481	$14,000	$125,000
MBPW Inc	309	Union St N	481	$12,600	$150,000
Park Centre Development Inc	313	Union St N	481	$6,800	$150,000
Park Centre Development Inc	315-17	Union St N	421	$11,300	$160,000
Kenney, Bruce	319	Union St N	481	$3,700	$70,000
Advertising Advantage, LLC	321	Union St N	481	$14,000	$20,000
Park Centre Development Inc	323	Union St N	330	$5,400	$5,400
ZRAJ Olean, LLC	400	Union St N	451	$1,789,000	$4,929,430
Austin, Lawrence L Sr	405	Union St N	482	$43,500	$110,800
Lamar Outdoor Advertising	405-B	Union St N	474	$0	$11,600
Austin, Lawrence L	413	Union St N	482	$14,800	$49,000
Wec 99J-49 LLC	415	Union St N	453	$350,000	$2,200,000
ZRAJ Olean, LLC	420	Union St N	451	$432,500	$2,913,574
St. Vincent De Paul Society	441-43	Union St N	482	$24,600	$130,000
GLR Holdings LLC	447	Union St N	426	$144,000	$658,900
ZRAJ Olean, LLC	450	Union St N	330	$7,000	$7,000
Key Bank of NY, NA	450	Union St N	462	$0	$400,000
Sevinski, Elizabeth Ann	457	Union St N	482	$28,700	$99,500
Park Centre Development Inc	461	Union St N	453	$40,000	$250,000
Park Centre Development Inc	465	Union St N	465	$53,000	$276,000
Fratercangelo, Anthony	475	Union St N	421	$46,800	$117,500

W & S Fox Family L.P.	483	Union St N	481	$42,000	$225,000
Lamar Outdoor Advertising	483-B	Union St N	474	$0	$1,600
Burger King Corp	500	Union St N	426	$101,300	$500,000
Park Centre Development Inc	501	Union St N	426	$51,600	$435,000
Park Centre Development Inc	502	Union St N	330	$260,000	$260,000
Park Centre Development Inc	510	Union St N	452	$0	$330,000
Park Centre Development Inc	512	Union St N	452	$0	$600,000
Park Centre Development Inc	513	Union St N	330	$5,500	$5,500
Park Centre Development Inc	515-21	Union St N	465	$31,200	$1,100,000
Park Centre Development Inc	520	Union St N	482	$0	$940,000
Park Centre Development Inc	523	Union St N	330	$4,200	$4,200
Park Centre Development Inc	525-27	Union St N	330	$5,000	$5,000
Park Centre Development Inc	529	Union St N	330	$4,300	$4,300
Park Centre Development Inc	533	Union St N	438	$1,000	$1,000
Coleman Sean	535	Union St N	425	$3,300	$75,000
Ouderkirk, David F	538-40	Union St N	632	$27,100	$110,000
City Of Olean-Firehouse 3	542	Union St N	662	$19,500	$185,000
Smith, Thomas C	601	Union St N	436	$15,000	$225,400
Dixie Gardens Apartments, Inc.	610	Union St N	426	$140,000	$450,000
Countryside ALF, LLC	611-13	Union St N	486	$32,000	$280,000
Parcel Count				Total AV	$48,346,404

CALCULATIONS FOR ENERGY REDUCTIONS

Energy Savings from Streetlights

Energy Cost of Single Streetlight Annually = $171.43

Number of Streetlights on N. Union = 60

Reduction Percentage with Energy Efficient Streetlights = 45%

Current Energy Cost of Streetlights = $171.43 * 60 = $10,285.70

Post Project Energy Cost of Streetlights = $10,285.70 * .55 = $5,657.14

Energy Savings from Roundabouts

Approximate Energy Savings from Removal of Traffic Signal = $5,000

Number of Traffic Signals Removed = 7

Energy Savings from Removal of Traffic Signals = $5,000 * 7 = $35,000

CALCULATIONS FOR AIR QUALITY BENEFITS

Monetized Value of Planted Tree = $997

Number of Trees Planted = 84

Monetized Value of New Trees = $997 * 84 = $83,748

- The City of Buffalo evaluated the benefits and costs of planting new trees for their Cars on Main Street Project. Considering benefits such as energy savings, carbon sequestration, air quality, and rain interception as well as costs including pruning, debris removal, and water usage, a single tree's monetary benefit was calculated to be $9,997. For a very conservative calculation of benefits, we decided to use approximately 10% of their value for our project.