

**Southeast Connector TIGER  
Grant Application**

**Technical Calculations Sheets**

### Carbon Credit Calculations - Des Moines SE Connector

Des Moines - Daily from Model							
	Travel VMT	Auto occupancy	auto PMT	auto btu's	Fuel (gal)	CO2 (lbs)	CO2 (metric Tons)
Without VMT	87,310,000						
Build VMT	83,330,000						
Delta VMT	3,980,000	1.2	4,776,000	16,782,864,000	135,374	2,626,261	1,191

#### Energy Comparison by Mode

BTU per passenger Mile(1)

Car	3,514
Air	3,103
Rail - Intercity	2,586

(1) - TRANSPORTATION ENERGY DATA BOOK: EDITION 28–2009 (US DOE) Page 2-14 or 63 of 379

#### Btu per gallon of Fuel

btu per gallon (2)

Share (2)

Gasoline	125,000	72.8%
Gasohol	120,900	26.7%
Diesel	138,700	0.5%
Weighted Average	123,974	

(2) - TRANSPORTATION ENERGY DATA BOOK: EDITION 28–2009 (US DOE) Table A1 - page A-4 or 259 of 379

Pounds of CO2 per gallon (3)

Gasoline	19.4
Diesel	22.2

(3)<http://www.epa.gov/otaq/climate/420f05001.htm>



DATA	SEC 14th to 30th	Notes
<b>Vehicle Operating Cost Savings</b>		
<b>Reference</b>		
<b>VMT Savings 2015</b>		
VMT Savings (Miles/Day)		
VMT Savings (Miles/Year)	2,985,000	Based on 0.75 x 2030 Modeled Savings of 3,980,000 Miles per year
<b>VMT Savings 2045</b>		
VMT Savings (Miles/Day)		
VMT Savings (Miles/Year)	4,975,000	Based on 1.25 x 2030 Modeled Savings of 3,980,000 Miles per year
<b>Cost Savings per Mile</b>		
Average Cost Per Mile	\$0.505	Federal Mileage Reimbursement Rate
<b>VOC Savings 2015</b>	\$1,507,425	
<b>VOC Savings 2045</b>	\$2,512,375	
<b>Job Creation Tax Benefits</b>		
		Construction jobs shown during construction phase. Long-term jobs shown phased in 10% per year starting 2015.
Estimate of Construction Based Jobs Created (Years of Employment Staggered during Construction Period)	700	Based on Council of Economic Advisors Guidance May 2009 of 1 Employment Year per \$92,000 spent
Average Wages per Job (2010)	\$51,021.43	Based on 2007 Iowa Wage Survey Data Adjusted to 2010 for 80% Highway Construction/Maintenance and 20% Civil Engineering
Tax Percentage per Job	19.40%	Based on IRS Data on Average Federal Percentage Paid plus Iowa State Tax Rate Data
Net Long-Term Economic Development Jobs Created (Shown from 2020 on)	273	Based on Redevelopment/Land Use Analysis
Average Value per Job (2010)	\$47,941.44	Based on Iowa Wage Survey Data for Several Industrial/Commercial Wage Categories for Common Industries in Project Area.
Tax Percentage per Job	19.40%	Based on IRS Data on Average Federal Percentage Paid plus Iowa State Tax Rate Data
<b>Property Tax Benefits Through Development</b>		
		Phased in at 10% per year starting 2015.
Total Acres of Redevelopment	72	
Net Gain in Value per Acre	\$623,000.00	From Southeast Connector Land Use Study - Shows an increase in land values from \$118,000 per acre to \$741,000 per acre for light industrial uses with redevelopment.
Property Tax Rate that Applies	0.04522	Typical Millage Rate for Parcels in that part of the City of Des Moines
<b>Values of Carbon Saved</b>		
Total Tons of Carbon Saved Per Year on Average	2626	Based on Change in 2030 Vehicle Miles Traveled (in tons not metric tonnes)
Value per Ton of Carbon	15	EPA Estimates of Waxman-Markey Climate Legislation Values Carbon at \$13 to \$17 per ton by 2015. Used \$15 per ton starting in 2014.
<b>Residual Values</b>		
<b>Reference</b>		
Value of Right-of-Way	\$5,146,000.00	From Cost Estimate in Engineering Report
Value of Bridges	\$11,090,000.00	
Value of Roadway	\$35,764,000.00	
Total Value		
Cross Check Capital Cost - Total Value		
Right-of-Way Residual	100%	
Bridge Residual	50%	
Roadway Residual	25%	
<b>Residual Values</b>	\$19,632,000.00	

## Estimated Travel Time Savings Spreadsheet

### BUILD Maury and SE 30th to Scott and SE 14th

Distance (miles)	Speed Limit (mph)	Travel Time (minutes)	whole number	decimal part	(seconds)
1.00	25	2.40	2.00	0.40	24
0.50	35	0.86	0.00	0.86	52
0.15	35	0.26	0.00	0.26	16
0.53	35	0.91	0.00	0.91	55

**2.18** 4:27

Assumes 30 second delay for two turns 0:30

4:57

### Build SEC

Distance (miles)	Speed Limit (mph)	Travel Time (minutes)	whole number	decimal part	(seconds)
0.30	30	0.60	0.00	0.60	36
0.78	35	1.34	1.00	0.34	20
0.47	35	0.81	0.00	0.81	49
0.50	35	0.86	0.00	0.86	52

**2.05** 3:37

Assumes 60 second delay at one traffic signal 1:00

4:37

**Travel Time savings of 20 seconds**