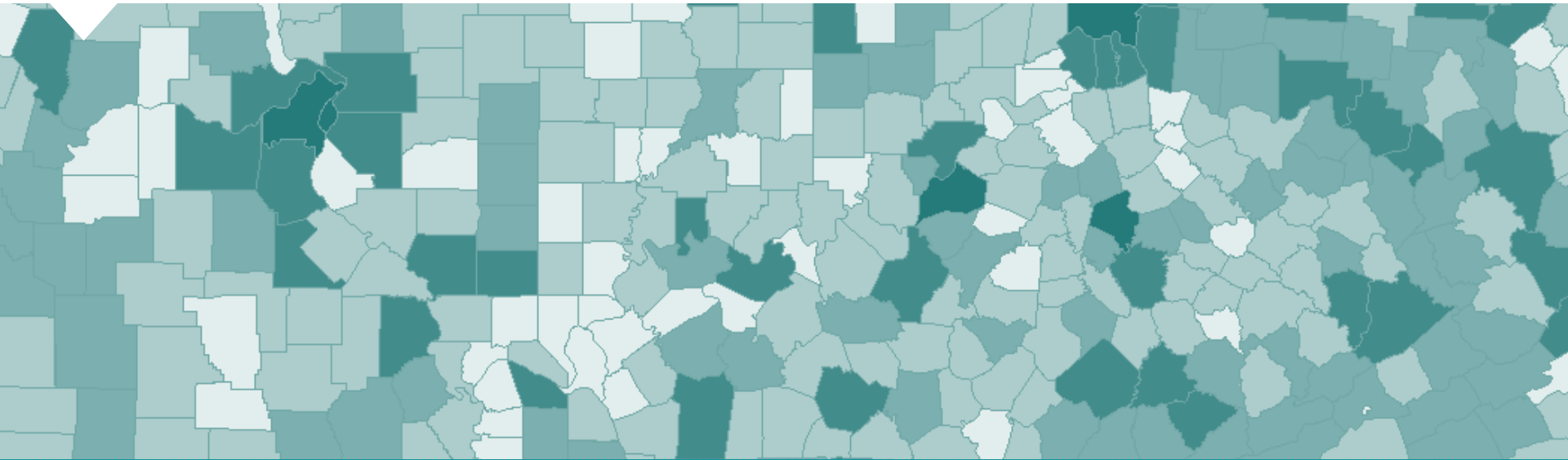




PRELIMINARY ANALYSIS

Great Lakes Basin Freight Railroad

Economy and Environment

May 2016

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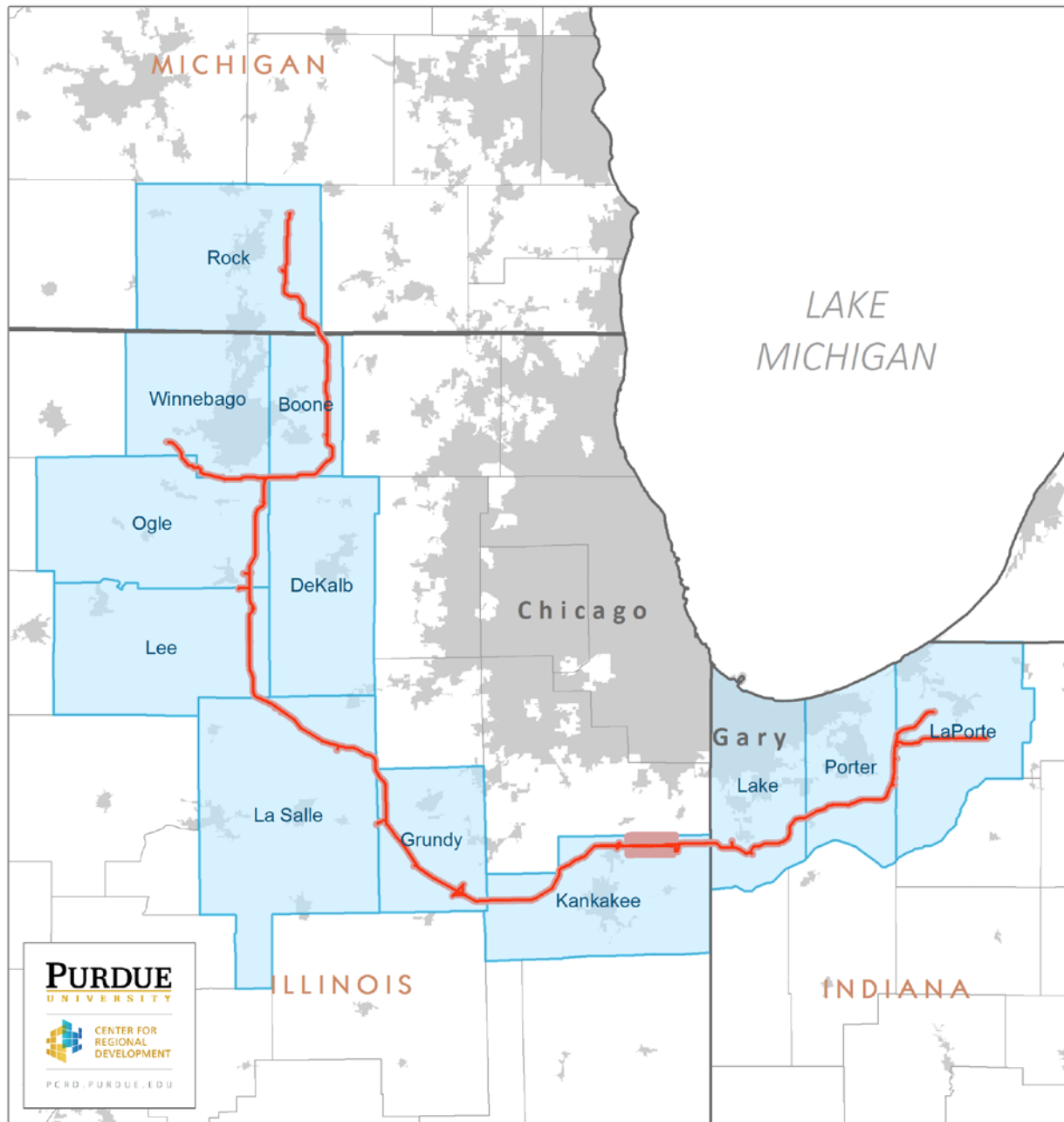
04

Environment

01 introduction

Proposed Corridor

Affected Counties



Proposed rail line corridor

Legend

- Proposed rail line
- 2 mi corridor
- Counties affected
- States
- Counties
- Urban areas, 2010



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Great Lakes Basin Rail Line

Proposed Rail Line



Great Lakes Basin Rail Line Rail Line

Source: Federal Railroad Administration (FRA)

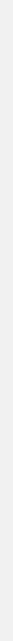


Affected Counties Profile

State	County	Population, 2015	Area, mi ²
Illinois	Boone	53,585	283
	DeKalb	104,352	633
	Grundy	50,541	430
	Kankakee	110,879	681
	LaSalle	111,333	1147
	Lee	34,584	728
	Ogle	51,659	769
	Winnebago	287,078	523
Indiana	Lake	487,865	503
	LaPorte	110,884	604
	Porter	167,688	421
Wisconsin	Rock	161,448	723

Source: U.S. Census Bureau, annual population estimates

02 literature review



Literature Review

- o Researchers have found a larger role of railroads to regional and national economies by improving the access and integration of markets leading to economic development (Donaldson and Hornbeck, 2012).
- o However, if not planned properly, freight movement, railroads, yards and associated land uses can cause noise and light pollution, unwanted odors, vibrations, safety concerns, and regional water and air quality impacts (FHWA, 2012).
- o Studies on impacts of transit and commuter rails on property values are plenty. In comparison the research on impacts of freight railroad on property prices are scant. A study of residential properties located near freight railroad in Cuyahoga County, Ohio found that houses of areas under 1,250 square feet lost values if located within 0.1 KMs from the railroad track (carriage way), whereas the price effects of large houses were mixed (Simons, R. and A. Jaouhari, 2004).
- o In a historical study of railroad impacts in late nineteenth century by the Nobel laureate economist Fogel using the “social savings” method showed, if all railroads were removed, the predicted lowering of agricultural land value could have been 73% during that period. However, if roads and canals were substituted, the loss of Gross National Product would simply be reduced to 5% in 1890 (Fogel 1964 and Taylor, 1965).

Literature Review: Preliminary Inferences

- o Fogel's study in some ways was counterfactual to the researchers such as Rostow that freight railroads made a significant contribution to the national economy including innovation in steel industry in the late nineteenth century (Plowman, 1966).
- o In an era of multiple modes of transportation and highly developed transport network, the benefits and costs analysis of a new freight railroad link would require a thorough regional economic analysis using a computable general equilibrium framework. Static input output models would be of limited use in this context!

References:

- FHWA Freight and Land Use Handbook, FHWA-HOP-12-006, http://www.ops.fhwa.dot.gov/publications/fhwahop12006/sec_2.htm
- Simons, R. and A. Jaouhari. 2004. The Effect of Freight Railroad Tracks and Train Activity on Residential Property Values. <http://www.coaltrainfacts.org/docs/The-effect-of-freight-railroad-tracks-and-train-activity-on-residential-property-values.pdf>. (accessed on May 17th, 2016).
- Donaldson, D. and R. Hornbeck. 2015. Railroads and American Economic Growth: A “Market Access” Approach. http://faculty.chicagobooth.edu/richard.hornbeck/Railroads_DH_Oct2015.pdf. (accessed on May 17th, 2016).
- Taylor, G. R. 1965. A book review of Railroads and American Economic Growth: Essays in Econometric History by R. W. Fogel. The American Economic Review. (accessed on May 18th, 2016).
- Fogel, R. W. 1964. Railroads and American Economic Growth: Essays in Econometric History. Baltimore: Johns Hopkins University Press.
- Plowman, E. G. 1966. Were Railroads Vital to 19th Century American Economic Growth? A Review Article. Transportation Journal. American Society of Transportation & Logistics Inc.

03 economy

2 mile corridor

1 mile corridor

National Establishment Time Series (NETS): Establishments within 2 mile corridor

	1992	2002	2012
Number of establishments	1,086	1,579	2,136
Number of jobs	7,594	11,036	9,693
Total sales (2014 \$ value)	\$1,181,868,607	\$1,494,758,796	\$771,033,101

Establishments within 2 mile Corridor, Indiana only

	1992		2002		2012	
	Indiana	% total	Indiana	% total	Indiana	% total
Number of establishments	289	26.6	491	31.1	735	34.4
Number of jobs	3,903	51.4	5,510	49.9	4,777	49.3
Total sales (2014 \$ value)	\$660,416,768	55.9	\$790,614,856	52.9	\$371,823,954	48.2

National Establishment Time Series (NETS): Establishments within 2 mile corridor

Code	Industry Title	Number of Establishments, Total	Number of Establishments, Indiana Only
11	Agriculture, Forestry, Fishing and Hunting	395	101
21	Mining	0	0
22	Utilities	1	1
23	Construction	230	88
31-33	Manufacturing	84	31
42	Wholesale Trade	86	33
44-45	Retail Trade	155	60
48-49	Transportation and Warehousing	114	32
51	Information	19	9
52	Finance and Insurance	37	6
53	Real Estate Rental and Leasing	85	29
54	Professional, Scientific, and Technical Services	132	45
55	Management of Companies and Enterprises	9	6
56	Administrative and Support and Waste Management and Remediation Services	451	173
61	Educational Services	20	13
62	Health Care and Social Assistance	31	10
71	Arts, Entertainment, and Recreation	26	8
72	Accommodation and Food Services	44	13
81	Other Services (except Public Administration)	184	66
92	Public Administration	33	11

Source: National Establishments Time Series, IEGC, Edward Lowe, PCRD

National Establishment Time Series (NETS): Establishments within 1 mile corridor

	1992	2002	2012
Number of establishments	377	612	871
Number of jobs	2,783	3,872	3,960
Total sales (2014 \$ value)	\$507,087,918	\$513,881,022	\$247,688,960

Establishments with 1 mile corridor, Indiana only

	1992		2002		2012	
	Indiana	% total	Indiana	% total	Indiana	% total
Number of establishments	118	31.3	193	31.5	290	33.3
Number of jobs	2,066	74.2	2,647	68.4	2,436	61.5
Total sales (2014 \$ value)	\$378,312,394	74.6	\$334,951,445	65.2	\$136,417,344	55.1

National Establishment Time Series (NETS): Establishments with 1 mile corridor

Code	Industry Title	Number of Establishments, Total	Number of Establishments, Indiana Only
11	Agriculture, Forestry, Fishing and Hunting	205	53
21	Mining	0	0
22	Utilities	0	0
23	Construction	99	35
31-33	Manufacturing	31	8
42	Wholesale Trade	35	14
44-45	Retail Trade	52	24
48-49	Transportation and Warehousing	55	15
51	Information	6	5
52	Finance and Insurance	13	5
53	Real Estate Rental and Leasing	40	14
54	Professional, Scientific, and Technical Services	43	14
55	Management of Companies and Enterprises	3	3
56	Administrative and Support and Waste Management and Remediation Services	195	63
61	Educational Services	5	4
62	Health Care and Social Assistance	5	3
71	Arts, Entertainment, and Recreation	9	1
72	Accommodation and Food Services	11	7
81	Other Services (except Public Administration)	56	18
92	Public Administration	8	4

Source: National Establishments Time Series, IEGC, Edward Lowe, PCRD

National Establishment Time Series (NETS): Key Points

- o In 2012, more than 2,000 establishments providing 9,693 jobs were located within the 2 mile corridor of the proposed freight railroad. In case of Indiana, 735 establishments providing more than 4,777 jobs were located within the 2 mile corridor.
- o In 2012, more than 870 establishments providing roughly 4,000 jobs were located within the 1 mile corridor of the proposed freight railroad. For Indiana, 290 establishments providing around 2,436 jobs were located within the 1 mile corridor.
- o Whereas, Indiana has only 3 out of 12 counties in the tristate region of IN-IL-WI, 34% of establishments and 49% of total jobs were located within the 2 mile corridor. Similarly, Indiana had 33% of total establishments and 62% of the total jobs located within the 1 mile corridor.
- o In terms of industry types identified through the NAICS 2-digit codes, other than mining all industry types were located within the 2 mile and 1 mile corridors.
- o Establishments from agriculture, construction, retail trade, transportation and warehousing, and administrative and support and waste management and remediation services were predominant.
- o It should be noted that 2 mile corridor is delineated by creating a buffer of 1 mile from centerline of the proposed railroad route in either direction. For 1 mile corridor, the buffer is ½-mile.

04 environment

Major River Crossing

Biodiversity

Land Cover

Great Lakes Basin Rail Line

Major River Crossing

Source: U.S. Geological Survey (USGS)



Wisconsin

Great Lakes Basin Rail Line Biodiversity

Multi-season satellite imagery from 1999-2001

*Note: The biodiversity type affected most by the GLBR is herbaceous agricultural vegetation

Illinois

Indiana

Biodiversity

NVC Formation

- Alpine Scrub, Forb Meadow and Grassland
- Barren
- Boreal Flooded and Swamp Forest
- Boreal Grassland, Meadow and Shrubland
- Cool Semi-Desert Cliff, Scree and Rock Vegetation
- Cool Semi-Desert Scrub and Grassland
- Cool Temperate Forest
- Current and Historic Mining Activity

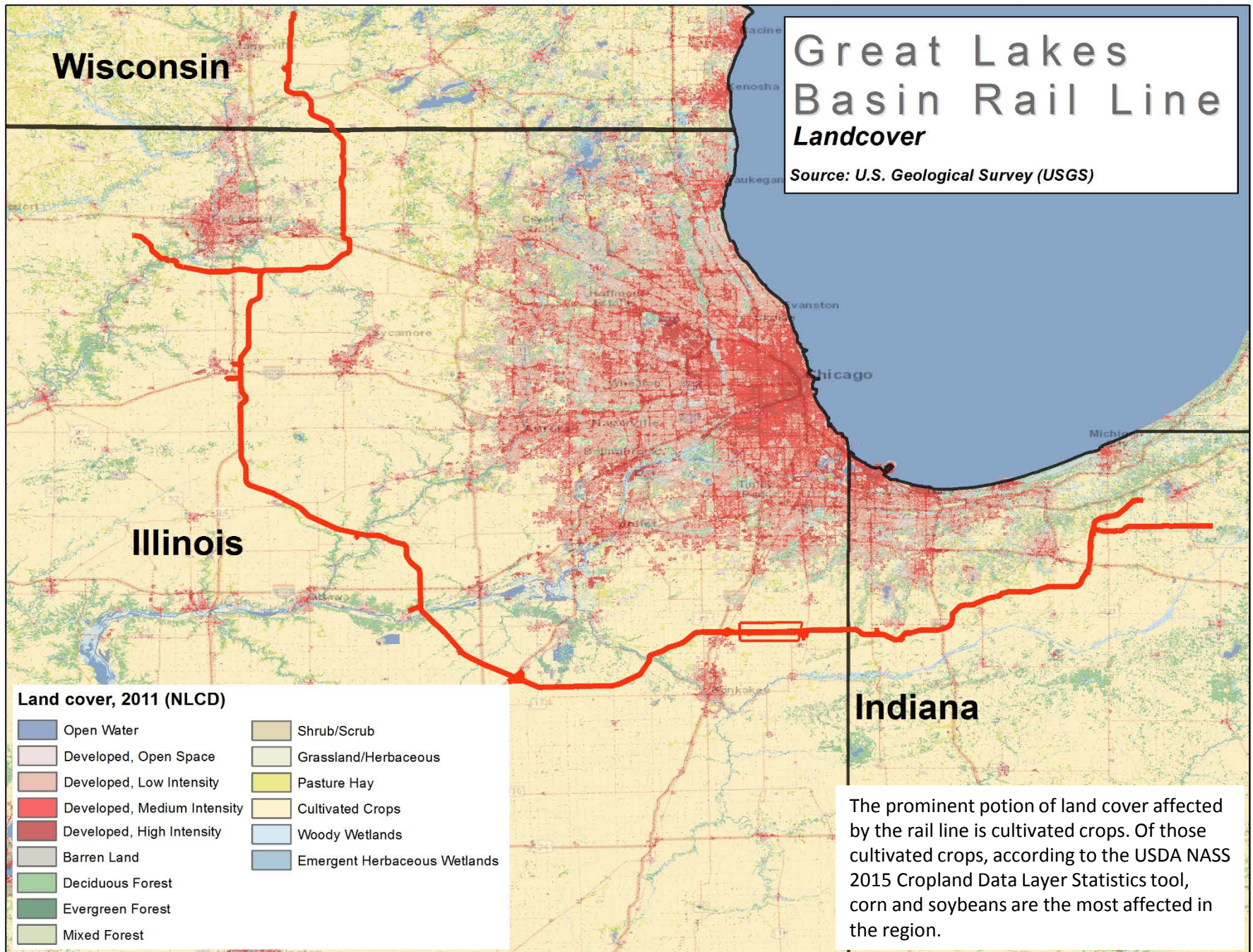
- Developed and Urban
- Freshwater Aquatic Vegetation
- Herbaceous Agricultural Vegetation
- Introduced and Semi Natural Vegetation
- Lowland and Montane Boreal Forest
- Mangrove
- Marine and Estuarine Saltwater Aquatic Vegetation
- Mediterranean Cliff, Scree and Rock Vegetation
- Mediterranean Grassland and Forb Meadow
- Mediterranean Scrub

- Open Water
- Polar and Alpine Cliff, Scree & Rock Vegetation
- Recently Disturbed or Modified
- Salt Marsh
- Temperate and Boreal Bog & Fen
- Temperate and Boreal Cliff, Scree & Rock Vegetation
- Temperate and Boreal Freshwater Wet Meadow & Marsh
- Temperate and Boreal Scrub & Herb Coastal Vegetation
- Temperate Flooded and Swamp Forest
- Temperate Grassland, Meadow and Shrubland

- Tropical (Semi-) Deciduous Forest
- Tropical Flooded and Swamp Forest
- Tropical Freshwater Marsh
- Tropical Scrub and Herb Coastal Vegetation
- Warm Semi-Desert Cliff, Scree and Rock Vegetation
- Warm Semi-Desert Scrub and Grassland
- Warm Temperate Forest
- Woody Agricultural Vegetation

Great Lakes Basin Rail Line Landcover

Source: U.S. Geological Survey (USGS)



Potential impact on land cover and crops: Indiana*

Land cover (crop) type	2 mile corridor, acres	2 mile corridor, %	1 mile corridor, acres	1 mile corridor, %
Corn	36,342.8	40.01	19,778.7	42.62
Soybeans	30,329.0	33.39	16,053.8	34.59
Grassland/Pasture	7,619.0	8.39	3,220.7	6.94
Deciduous Forest	6,258.2	6.89	2,710.5	5.84
Developed/Low Intensity	2,885.3	3.18	1,222.5	2.63
Developed/Open Space	2,156.3	2.37	964.7	2.08
Woody Wetlands	1,772.7	1.95	839.8	1.81
Winter Wheat	928.7	1.02	443.9	0.96
Developed/Med Intensity	506.2	0.56	202.6	0.44
Shrubland	469.5	0.52	223.1	0.48
Alfalfa	464.1	0.51	221.1	0.48
Open Water	232.6	0.26	130.3	0.28
Developed/High Intensity	187.3	0.21	92.1	0.20
Herbaceous Wetlands	145.4	0.16	66.7	0.14
Barren	135.7	0.15	59.2	0.13
Herbs	123.9	0.14	65.2	0.14
Fallow/Idle Cropland	107.4	0.12	28.9	0.06
Other Hay/Non Alfalfa	91.0	0.10	53.8	0.12
Evergreen Forest	64.3	0.07	24.2	0.05
Cucumbers	6.0	0.01	1.3	0.00
Rye	4.7	0.01	2.9	0.01
Oats	3.1	0.00	0.4	0.00
Mixed Forest	2.4	0.00	0.4	0.00
Double Crop Winter Wheat/Soybeans	1.6	0.00	0.4	0.00
Pumpkins	0.9	0.00	0.2	0.00
Pop or Orn Corn	0.4	0.00	0.2	0.00
Tomatoes	0.2	0.00		
Apples	0.2	0.00		
Total	90,839.0	100.0	46,407.7	100.0

* Land cover types are sorted based on "2 mile corridor, acres" field values

Source: USDA National Agricultural Statistics Service, 2015

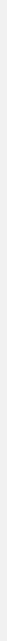
Potential impact on land cover and crops: tristate*

Land cover (crop) type	2 mile corridor, acres	2 mile corridor, %	1 mile corridor, acres	1 mile corridor, %	Land cover (crop) type	2 mile corridor, acres	2mile corridor, %	1 mile corridor, acres	1 mile corridor, %
Corn	179,559.5	45.95	97,120.3	46.88	Evergreen Forest	69.8	0.02	26.9	0.01
Soybeans	126,969.9	32.49	69,959.3	33.77	Mixed Forest	29.6	0.01	12.5	0.01
Grassland/Pasture	23,155.5	5.93	11,067.9	5.34	Winter Wheat/Soybeans	21.6	0.01	2.7	0.00
Deciduous Forest	22,396.5	5.73	10,133.4	4.89	Rye	12.5	0.00	3.8	0.00
Developed/Low Intensity	10,756.8	2.75	5,154.4	2.49	Other Crops	11.6	0.00	3.6	0.00
Developed/Open Space	9,653.9	2.47	4,713.7	2.28	Pumpkins	11.6	0.00	5.8	0.00
Winter Wheat	3,527.8	0.90	1,814.1	0.88	Cucumbers	6.0	0.00	1.3	0.00
Alfalfa	3,263.6	0.84	1,786.3	0.86	Potatoes	5.8	0.00	3.3	0.00
Woody Wetlands	2,213.9	0.57	1,039.2	0.50	Cabbage	4.4	0.00	4.0	0.00
Developed/Med Intensity	1,973.5	0.51	864.2	0.42	Christmas Trees	2.9	0.00	0.4	0.00
Open Water	1,521.4	0.39	726.1	0.35	Triticale	2.9	0.00	2.2	0.00
Herbaceous Wetlands	1,100.6	0.28	532.6	0.26	Switchgrass	1.8	0.00	1.3	0.00
Barren	936.9	0.24	362.9	0.18	Pop or Orn Corn	1.6	0.00	1.1	0.00
Fallow/Idle Cropland	823.1	0.21	547.5	0.26	Clover/Wildflowers	1.6	0.00	1.1	0.00
Shrubland	765.0	0.20	390.1	0.19	Speltz	1.1	0.00	0.2	0.00
Sweet Corn	515.5	0.13	251.5	0.12	Barley/Soybeans	0.7	0.00		
Developed/High Intensity	432.3	0.11	154.8	0.07	Sorghum	0.4	0.00		
Oats	298.9	0.08	165.7	0.08	Walnuts	0.4	0.00		
Other Hay/Non Alfalfa	264.2	0.07	153.9	0.07	Peppers	0.4	0.00	0.4	0.00
Sod/Grass Seed	148.6	0.04	59.8	0.03	Sunflower	0.2	0.00		
Herbs	124.1	0.03	65.2	0.03	Tomatoes	0.2	0.00		
Peas	93.4	0.02	35.8	0.02	Apples	0.2	0.00		
Dry Beans	87.0	0.02	15.8	0.01	Greens	0.2	0.00	0.2	0.00
					Total	390,582.1	100.00	207,114.7	100.00

* Land cover types are sorted based on "2 mile corridor, acres" field values

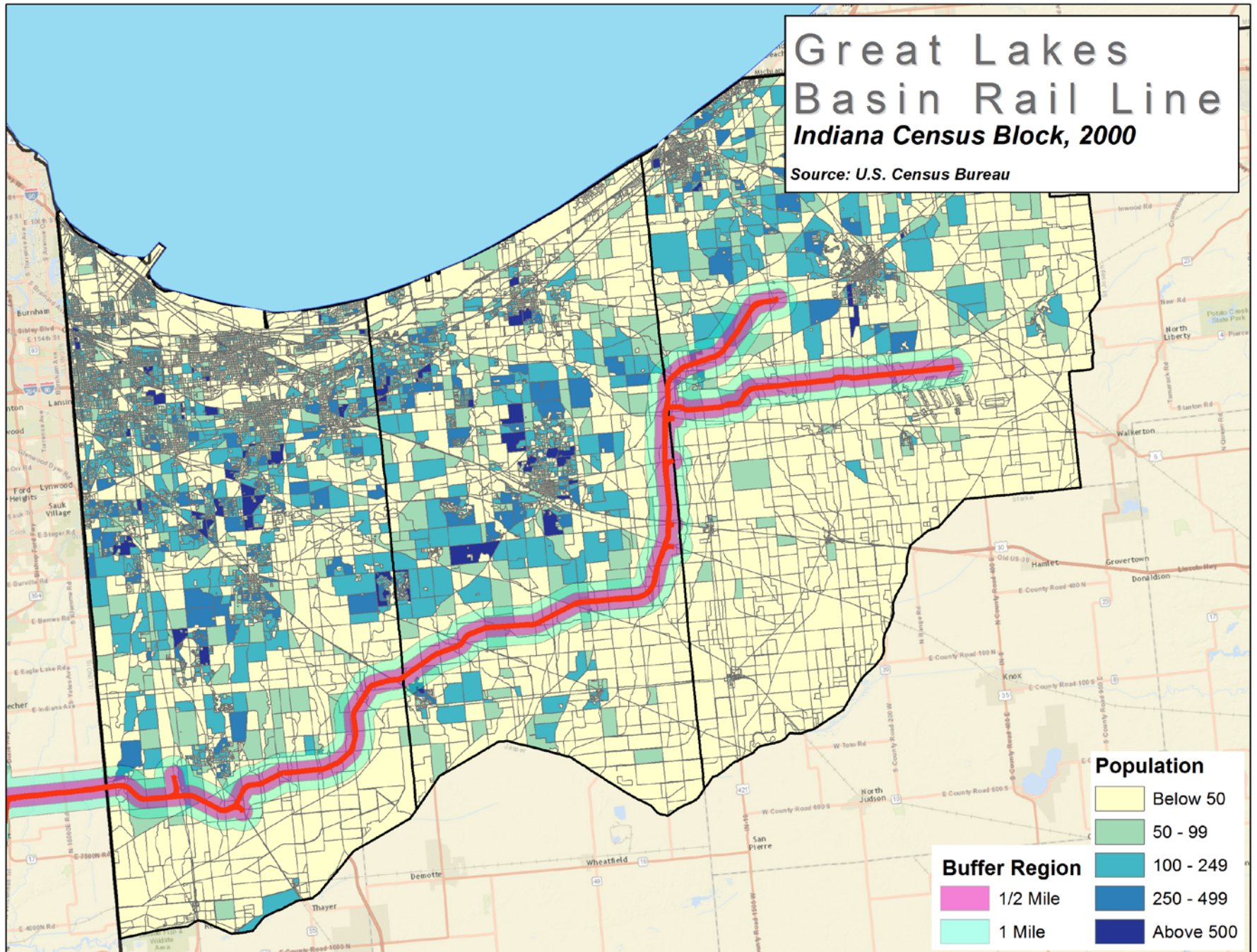
Source: USDA National Agricultural Statistics Service, 2015

05 demography



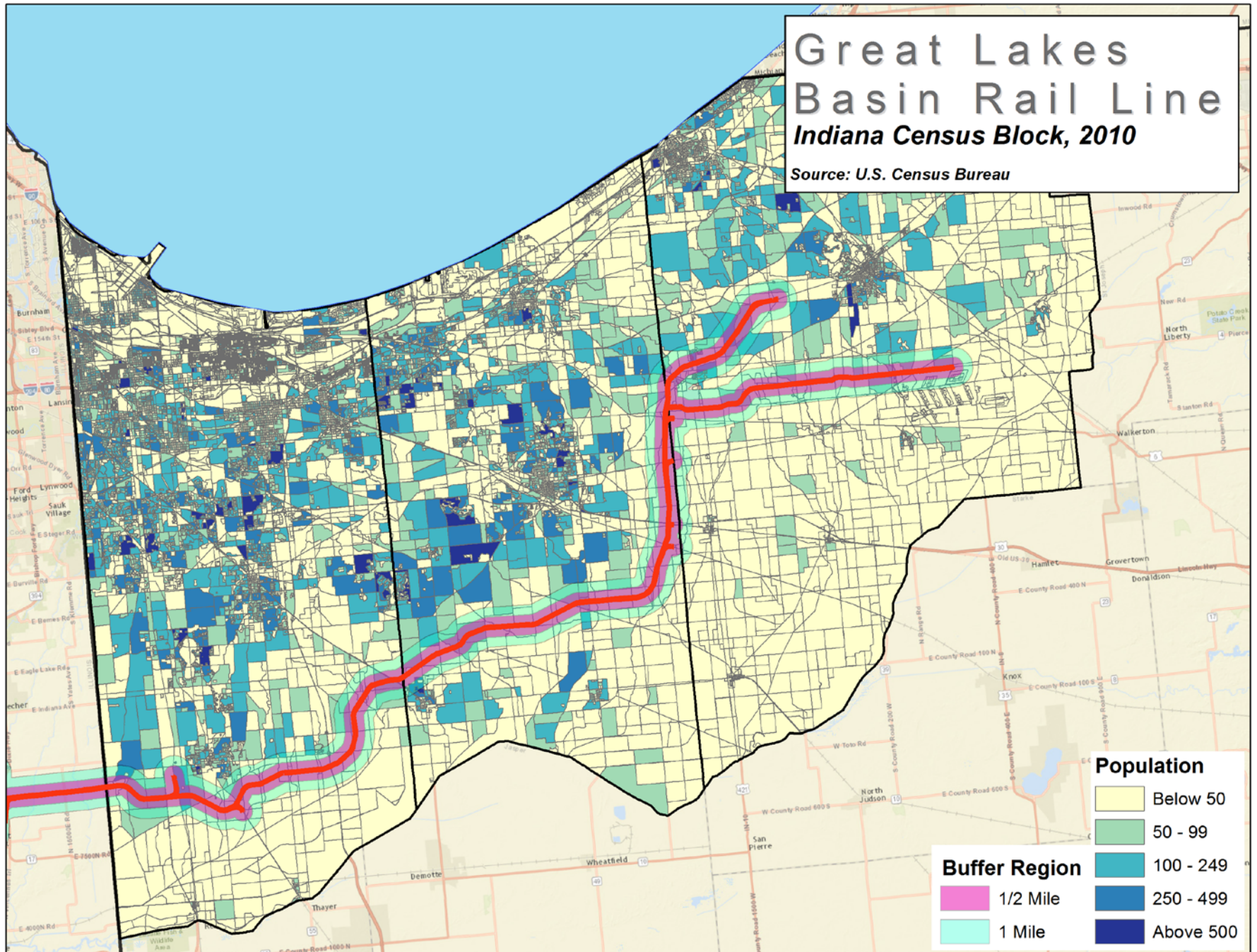
Great Lakes Basin Rail Line *Indiana Census Block, 2000*

Source: U.S. Census Bureau



Great Lakes Basin Rail Line *Indiana Census Block, 2010*

Source: U.S. Census Bureau



Population in Census Blocks and Census Tracts along the Rail Corridor in Indiana

Population by Census Blocks	2000 (Census Block)	2010 (Census Block)
Population in census blocks intersected by the rail line corridor	2,741	6,217
Population in census blocks intersected by 1-Mile wide corridor	10,936	12,365
Population in census blocks intersected by 2-Mile wide corridor	16,133	20,313

Population by Census Block Groups	2010-2014 (Census Block Groups)
Population in census block groups intersected by the rail line corridor	38,497
Population in census block groups intersected by 1-Mile wide corridor	50,344
Population in census block groups intersected by 2-Mile wide corridor	61,727

- o Census block group is a larger geography than the census block. For ACS 2010-2014, census block data was not available. Small area population estimates from ACS contain relatively large margins-of-error.

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This report was prepared by the Purdue Center for Regional Development in partnership with Purdue University Extension.



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