IL 47 - Purpose and Need

Purpose:

The purpose of the project is to address transportation safety, capacity, access management, pedestrian and bicycle needs, and geometric deficiencies.

Needs:

- Safety
- Capacity/Operations
- Access Management
- Bicycle/Pedestrian Accommodation
- Geometric Deficiencies

- **Alternatives development combines:**
  - Stakeholder input
  - Project purpose and needs
  - Analysis of existing environment
  - Technical analysis of design requirements and constraints

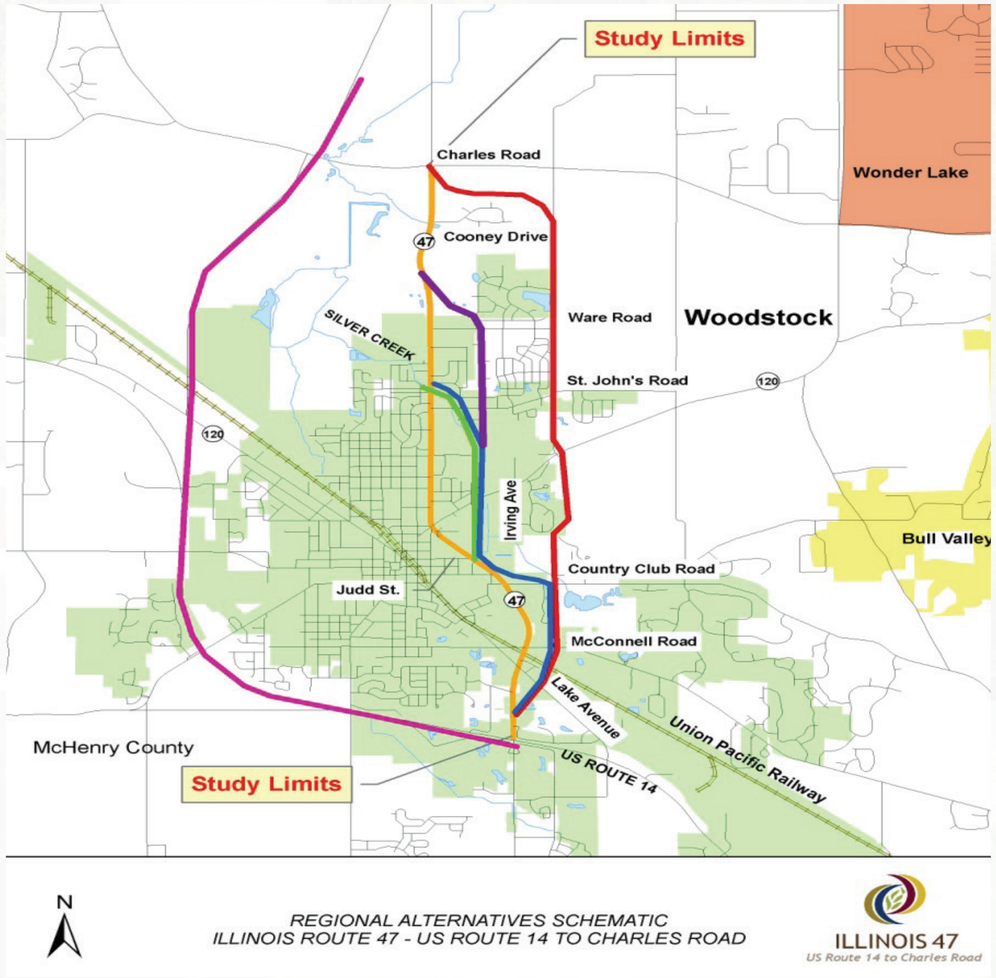
Evaluation Criteria

- **Environmental impacts**
  - Parks, air quality, wetlands
- **Accessibility**
  - Traffic control, Vehicles, bicyclists and pedestrians
- **Identified needs**
  - Safety, capacity, and mobility
- **Property impacts**
  - Residential, commercial, industrial, land use plans
- **Construction costs and maintenance**

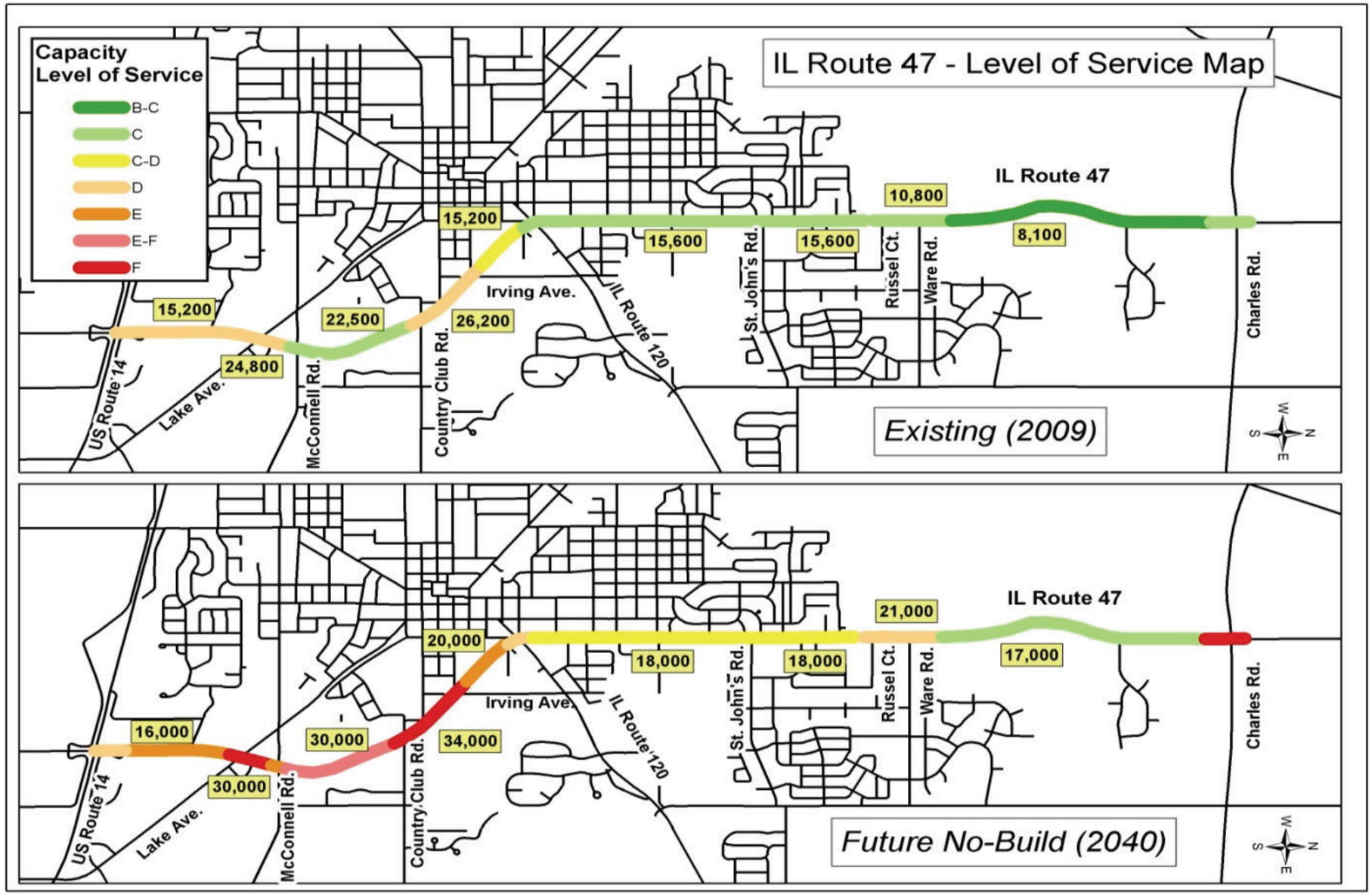
Full Range of Alternatives

- **On-Alignment Alternatives**
- **No Build Alternative**
- **Bypass Alternatives**
  - **B1:** Full Western
  - **B2:** Full Eastern
- **One-Way Couplet Alternatives:**
  - **C1:** Southview to St. John's
  - **C2:** Southview to Ware
  - **C3:** Irving to St. John's
  - **C4:** Irving to Ware

The bypass and one-way couplet alternatives were analyzed and dismissed since the detailed traffic analysis demonstrated they did not satisfy the project's Purpose and Need.



Roadway - Traffic Operations



Corridor Level of Service Map – Increasing Average Daily Traffic (ADT's) lead to congestion

Roadway - Safety, Crash Data

CRASH SUMMARY

CRASH TYPE	Year 2010	2011	2012	Total	% of Total
REAR-END	75	97	71	243	60.9%
TURNING	38	12	16	66	16.5%
ANGLE	14	22	17	53	13.3%
SIDESWIPE SAME	6	3	4	13	3.3%
FIXED OBJECT	0	3	2	5	1.3%
ANIMAL	0	2	2	4	1.0%
OTHER	4	5	6	15	3.8%
TOTALS	137	144	118	399	100.0%

ROADWAY CONDITION					
DRY	101	92	97	290	72.7%
RAIN	29	39	14	82	20.6%
SNOW/ICE	6	8	2	16	4.0%
OTHER/UNKNOWN	1	5	5	11	2.8%

CRASH SEVERITY

CRASH TYPE	Year 2010	2011	2012	Total	% of Total Crashes
PROPERTY DAMAGE ONLY	102	100	77	279	69.9%
INJURY CRASHES	35	44	41	120	30.1%
TOTALS	137	144	118	399	100.0%

INJURY TYPE	2010	2011	2012	Total	% of Injury Crashes
A	3	2	5	10	5.5%
B	29	17	22	68	37.2%
C	25	45	35	105	57.4%
K	0	0	0	0	0.0%
TOTALS	57	64	62	183	100.0%

Roadway - Safety, Crash Data: Intersections

INTERSECTION CRASH SUMMARY

INTERSECTION	Year			Total Crashes	% of Total Crashes	Crash Injuries (2010-2012)				TOTAL
	2010	2011	2012			A	B	C	K	
US ROUTE 14	14	5	5	24	6.0%	3	10	7	0	20
SOUTHVIEW DRIVE	2	1	2	5	1.3%	0	3	3	0	6
LAKE AVENUE	14	25	17	56	14.0%	2	5	17	0	24
MCCONNELL ROAD	7	8	10	25	6.3%	0	4	4	0	8
COUNTRY CLUB ROAD	11	12	8	31	7.8%	2	5	8	0	15
JUDD STREET/IRVING AVE.	6	3	4	13	3.3%	0	3	0	0	3
MCHENRY AVE. (IL RT 120)	2	8	4	14	3.5%	0	0	3	0	3
ST. JOHN'S ROAD	5	1	2	8	2.0%	0	1	0	0	1
RUSSEL COURT	1	0	0	1	0.3%	0	0	0	0	0
WARE ROAD	1	1	1	3	0.8%	0	0	0	0	0
CHARLES ROAD	3	3	3	9	2.3%	1	0	0	0	1
TOTALS	66	67	56	189	47.4%	8	31	42	0	81

A = Incapacitating Injury
B = Non-incapacitating Injury
C = Reported, not evident
K = Fatal

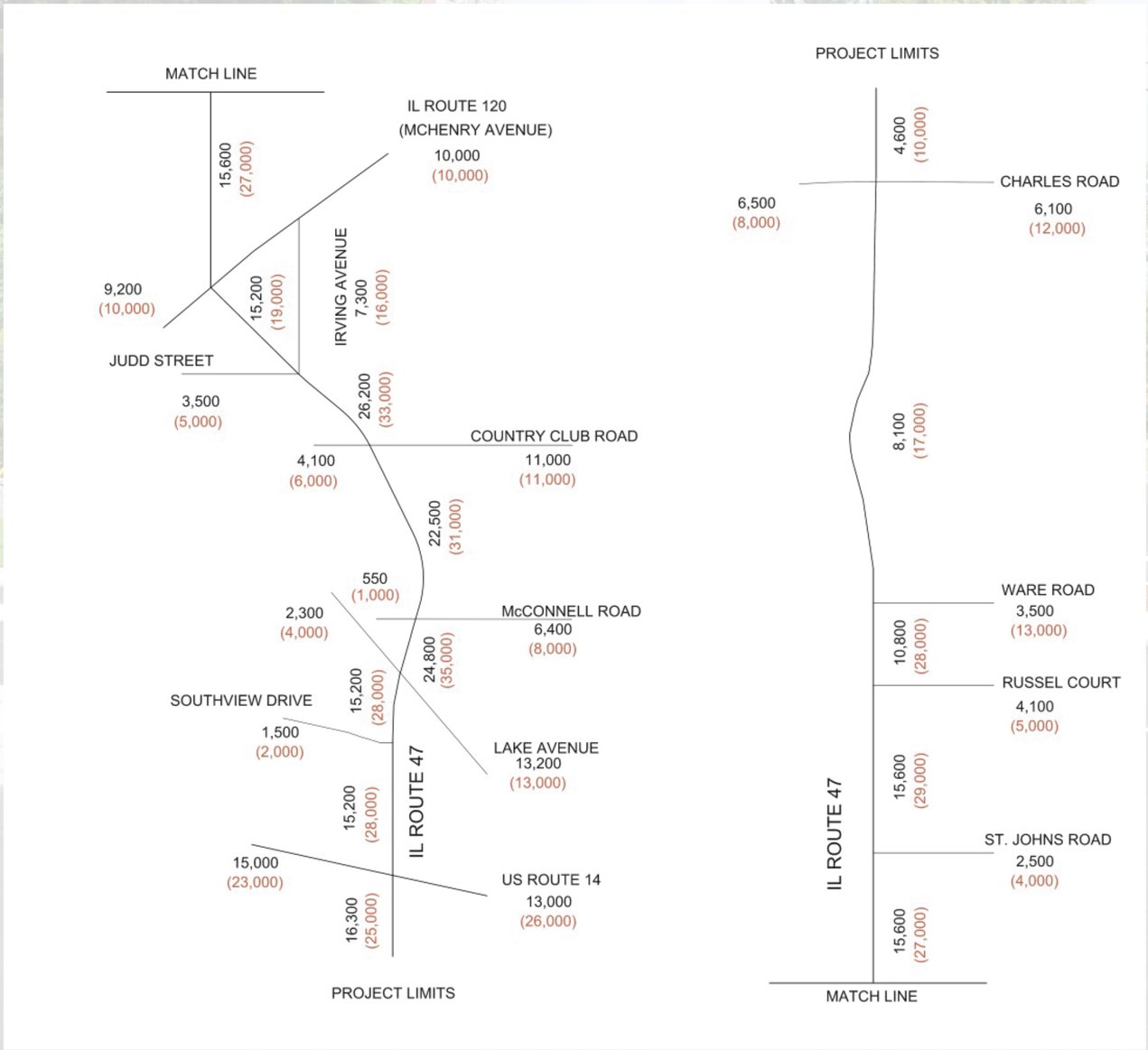
Roadway - Intersection Operations

Intersections modeled with Highway Capacity Software (HCS) for Existing and Future No-Build Condition (FNB)

PM Peak Hour	Existing (2009)				Future No Build (2040)			
Intersection	Delay (seconds/ vehicle)	Level of Service	Queue Length (ft)		Delay (seconds/ vehicle)	Level of Service	Queue Length (ft)	
			NB	SB			NB	SB
US Route 14	36.0	D	420	440	45.6	D	520	435
Lake Avenue	40.1	D	785	855	131.4	F	970	1565
McConnell Road	23.0	C	1115	670	89.7	F	3125	2725
Country Club Road	36.6	D	1120	225	134.6	F	4275	830
Judd Street/Irving Avenue	44.7	D	2045	540	181.4	F	5175	830
IL Route 120 / McHenry Avenue	34.1	C	710	985	58.5	E	1475	2035
Russel Court	20.5	C	510	445	33.0	E	2305	1705

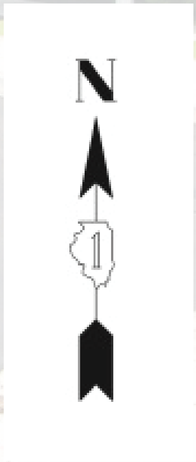
- **Existing Condition: 4 intersections with LOS D**
- **FNB (2040): 1 intersection with LOS D, 2 LOS E, 4 LOS F**
- **Queue's become excessive, in several locations approaching or exceeding 1/2 mile in length**

Roadway—Build On Alignment Improvements



AVERAGE DAILY TRAFFIC VOLUMES

EXISTING 2009
PROJECTED (2040)



Typical Section Rendering

Looking North from IL Route 120 Intersection

5′	3′		11′ - 12′	11′ - 12′	22′ and varies	11′ - 12′	11′ - 12′		5′	10′
Sidewalk			Travel Lane	Travel Lane	Barrier Median/ Turn Lane	Travel Lane	Travel Lane			Shared Use Path