

Diverging Windmill, What Is It and What Are Its Benefits?

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Outline

- Issues with Existing Systems Interchange Forms
- Description of the Diverging Windmill Interchange
- Advantages
- Any Disadvantages?
- Semi-Directional Diverging Windmill
- Summary

Existing System Interchange Forms

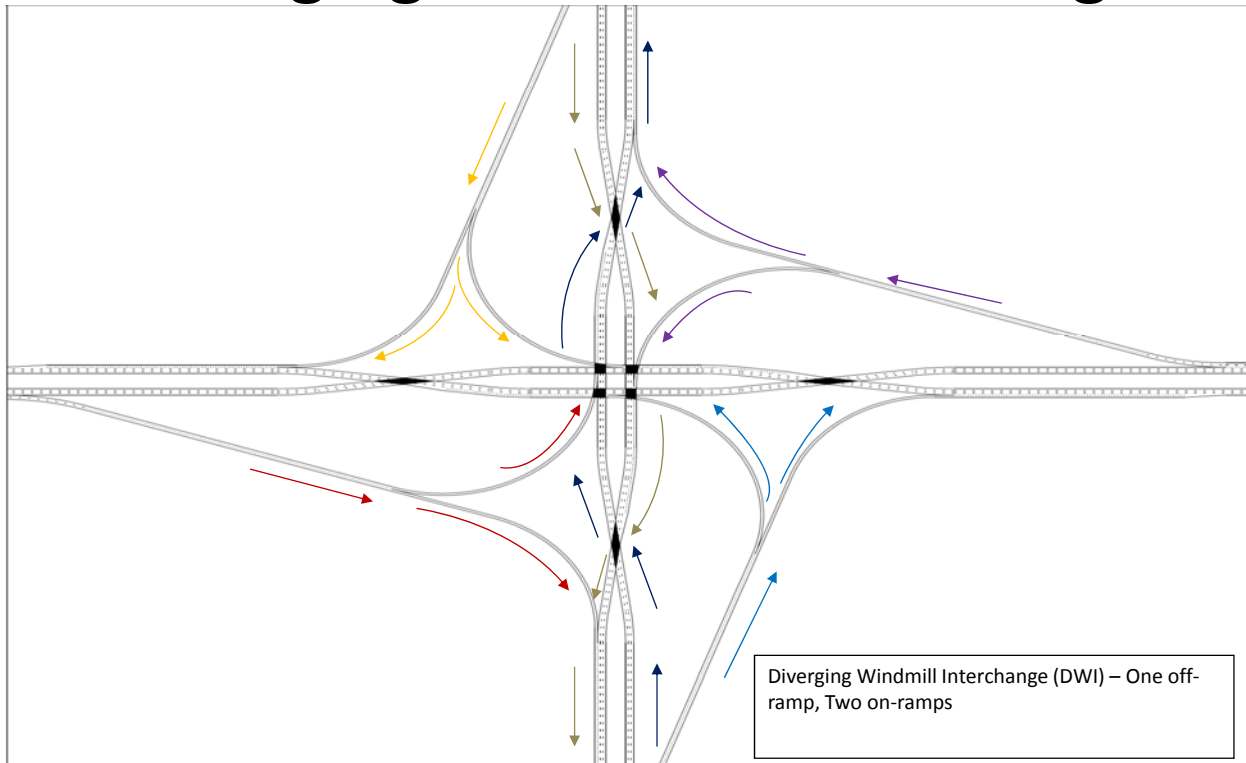
- Cloverleaf
- Semi-Directional
- All-Directional

AASHTO Green Book

Issue with Interchange Forms

- Cloverleaf
 - Weaving
 - Slow Speed Ramps 55-30-55
- All Directional
 - Expensive
 - Impactive
- Semi-Directional
 - Combination of the Two

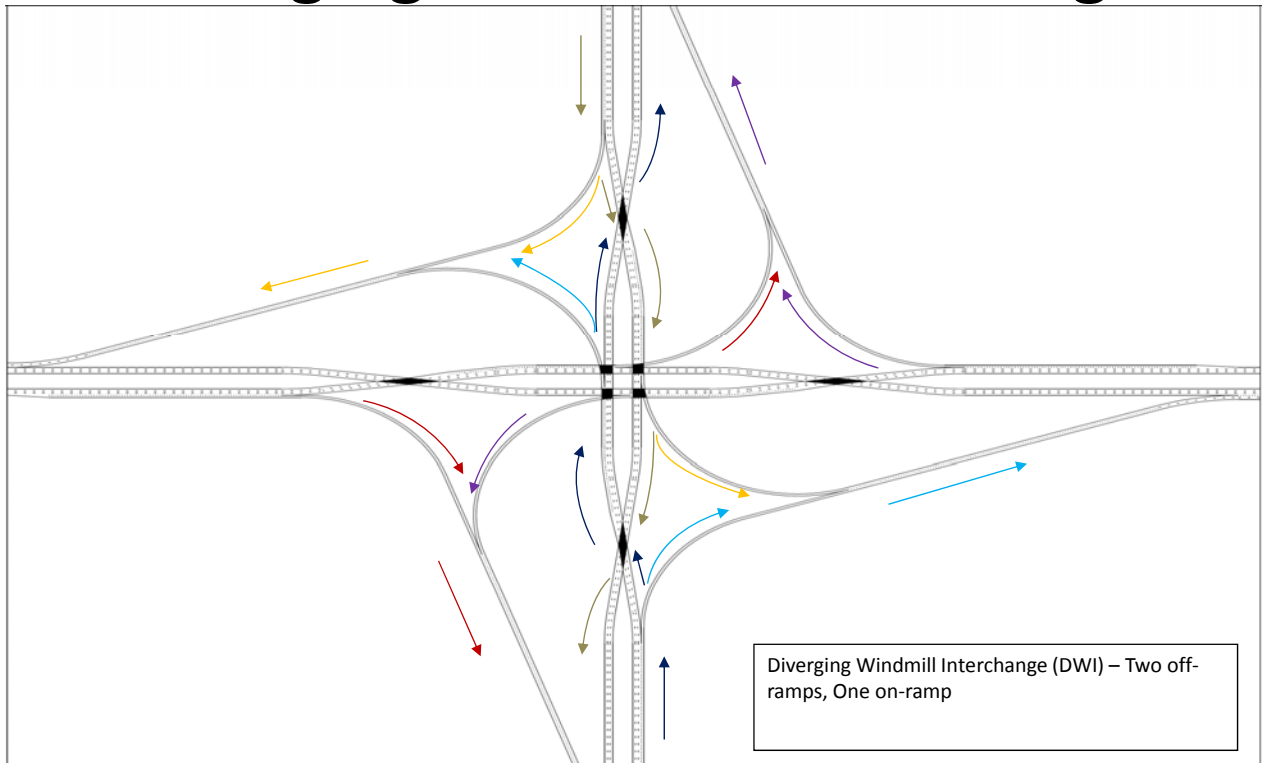
Diverging Windmill Interchange



Diverging Windmill Interchange (DWI) – One off-ramp, Two on-ramps

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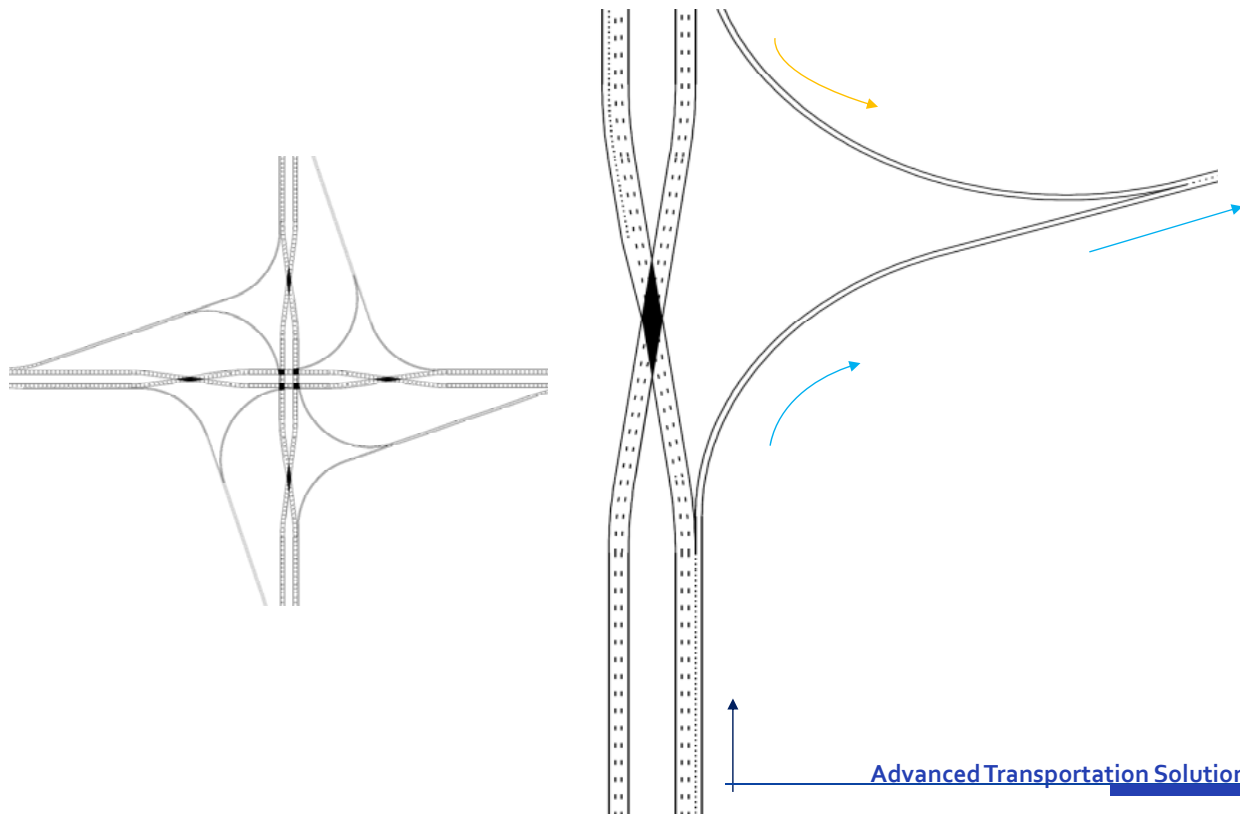
Diverging Windmill Interchange



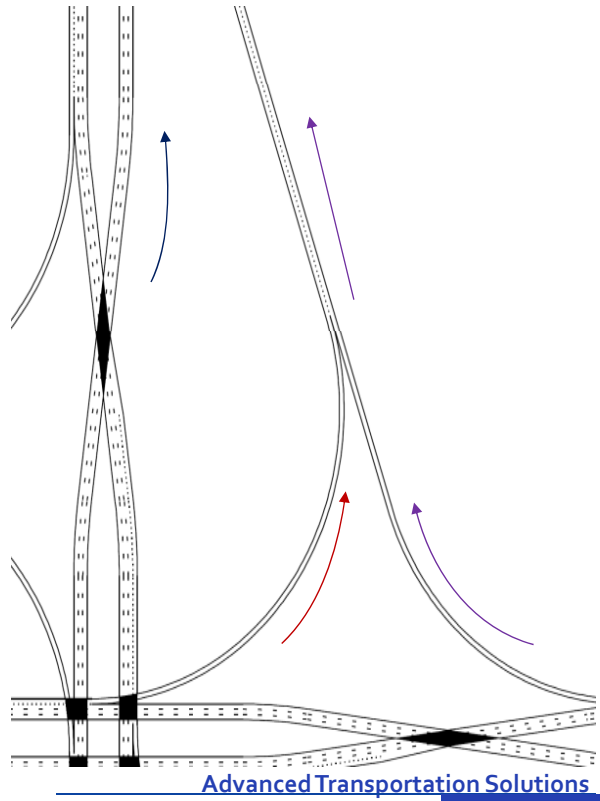
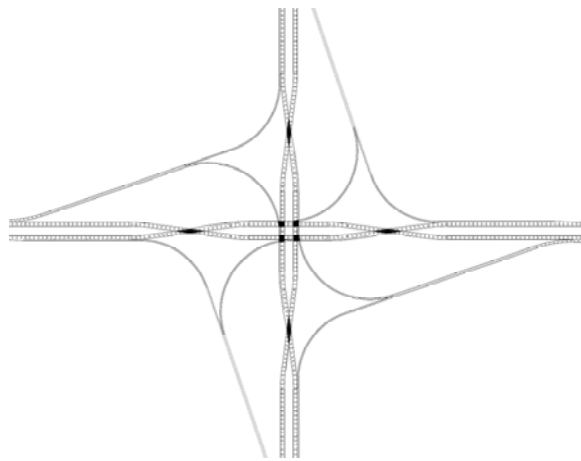
Diverging Windmill Interchange (DWI) – Two off-ramps, One on-ramp

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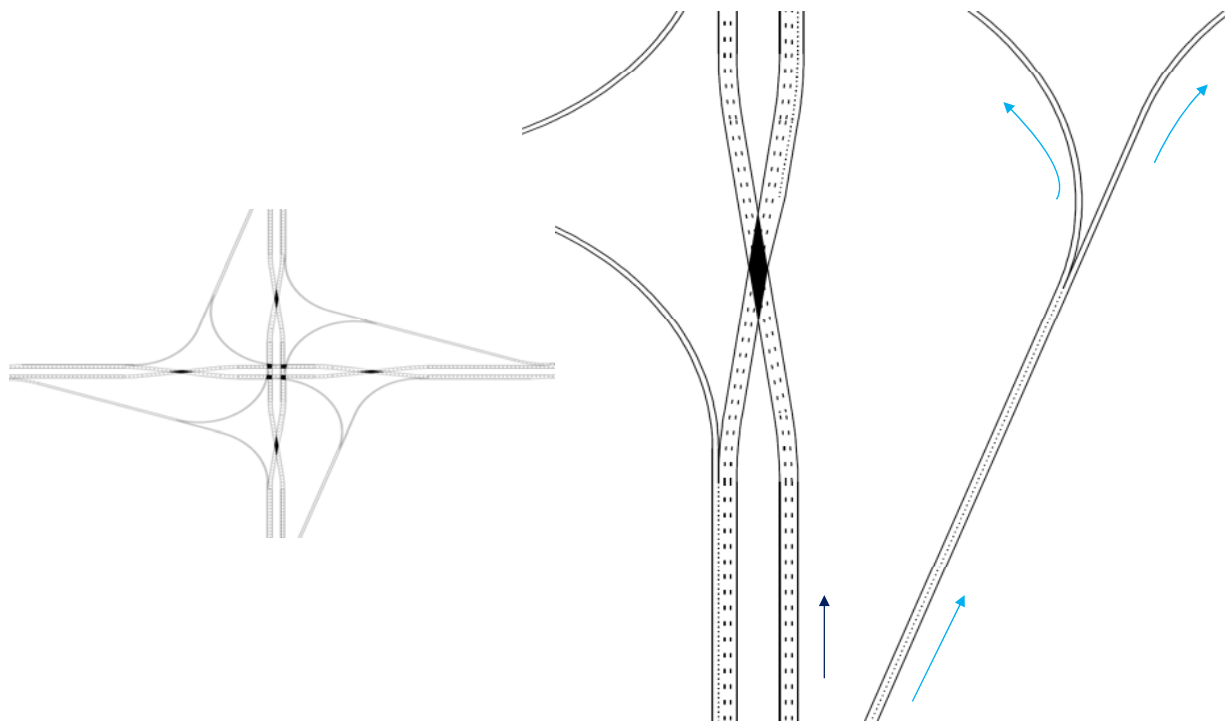
Diverging Windmill Interchange



Diverging Windmill Interchange

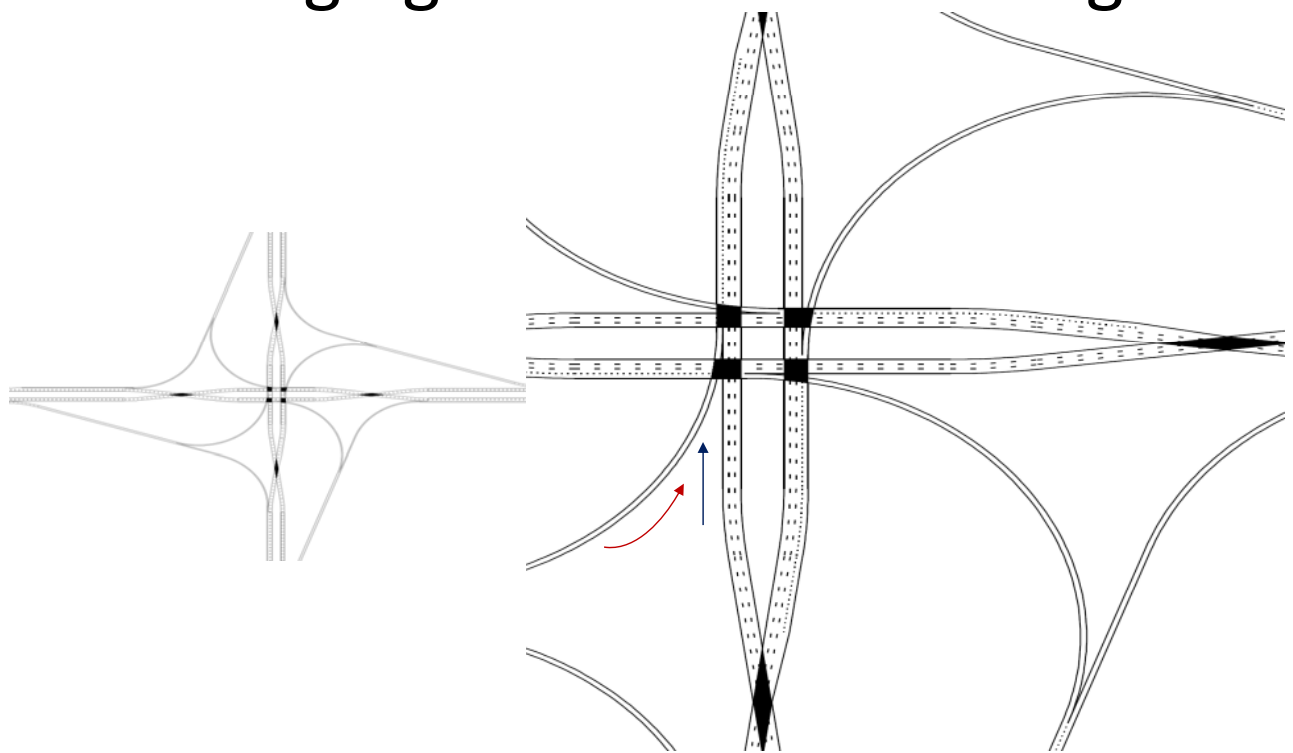


Diverging Windmill Interchange



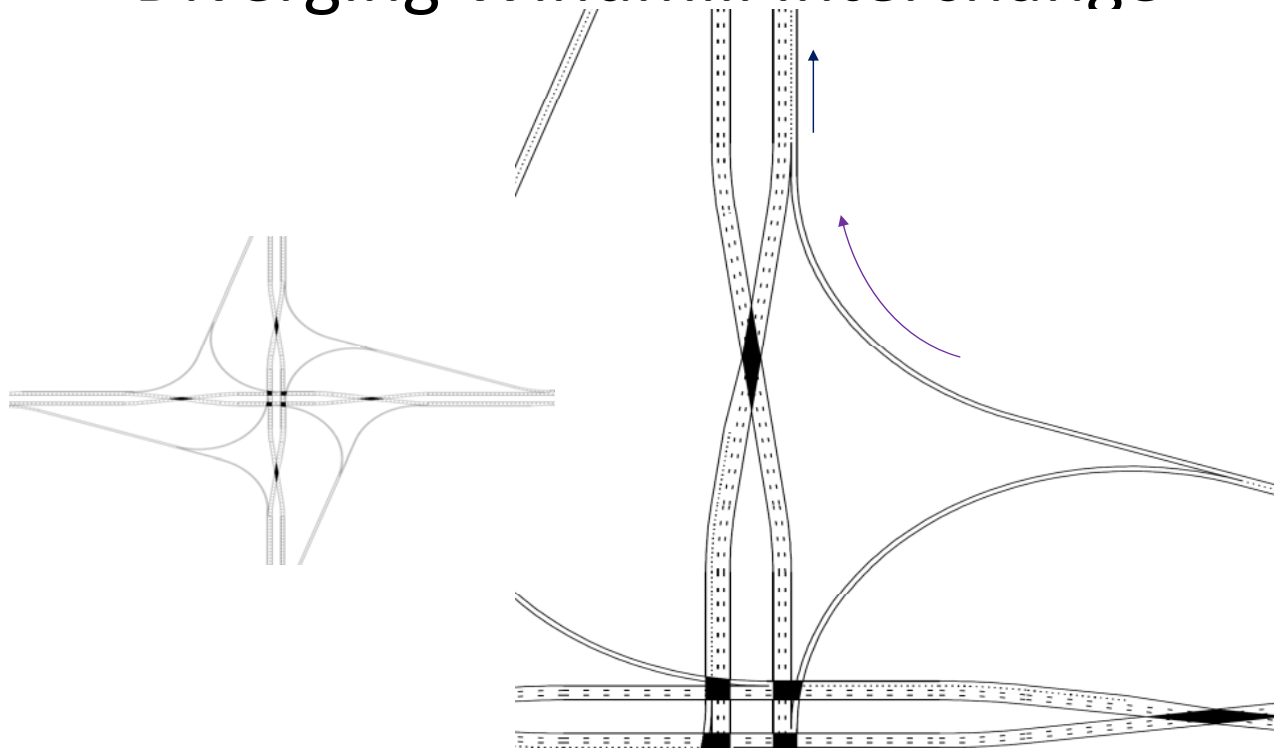
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Diverging Windmill Interchange



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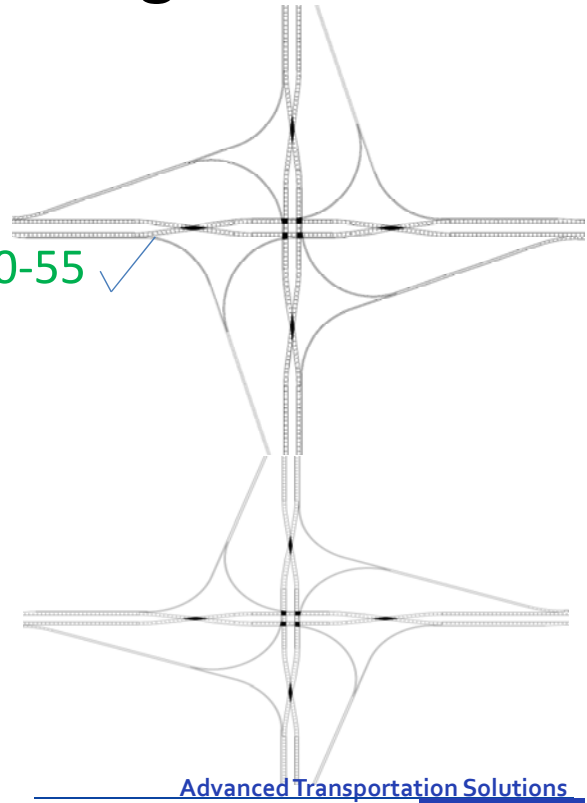
Diverging Windmill Interchange



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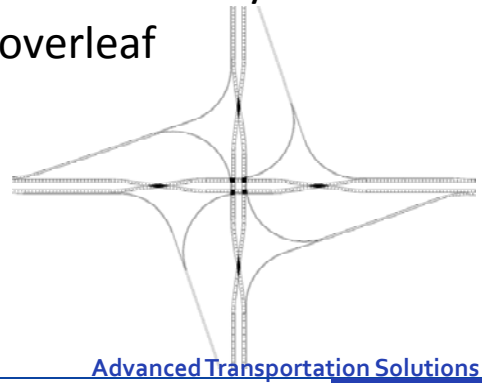
Issue with Interchange Forms

- Cloverleaf
 - Weaving ✓
 - Slow Speed Ramps 55-30-55 ✓
- All Directional
 - Expensive ✓
 - Impactive ✓
- Semi-Directional
 - Combination of the Two



Diverging Windmill Interchange

- Crossover movements can be grade-separated or at-grade
- Each direction of traffic has either one left exit or entrance from the left
- More bridge structures possible, but all bridges would be simple one-way roads going over other one-way roads
- Less right-of-way needed than a cloverleaf
- No flyovers needed
- No weaving issues



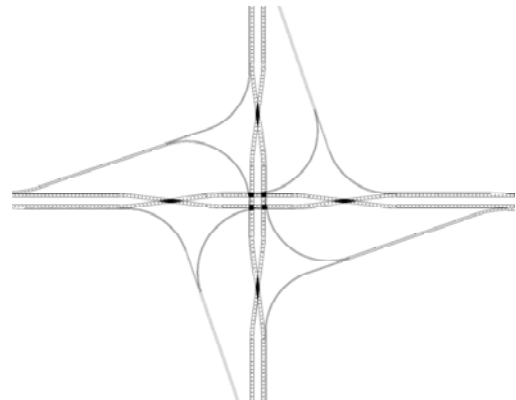
Any Disadvantages?



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Left Side Ramps

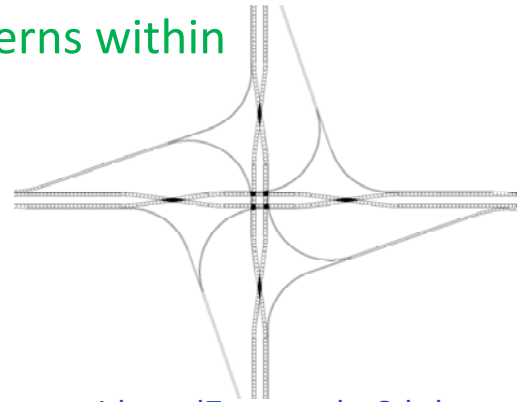
- Disadvantages?
 - Driver Expectancy
 - Heavy Lane Shifting
 - High Speed Merging
 - Safety
 - Future Widening



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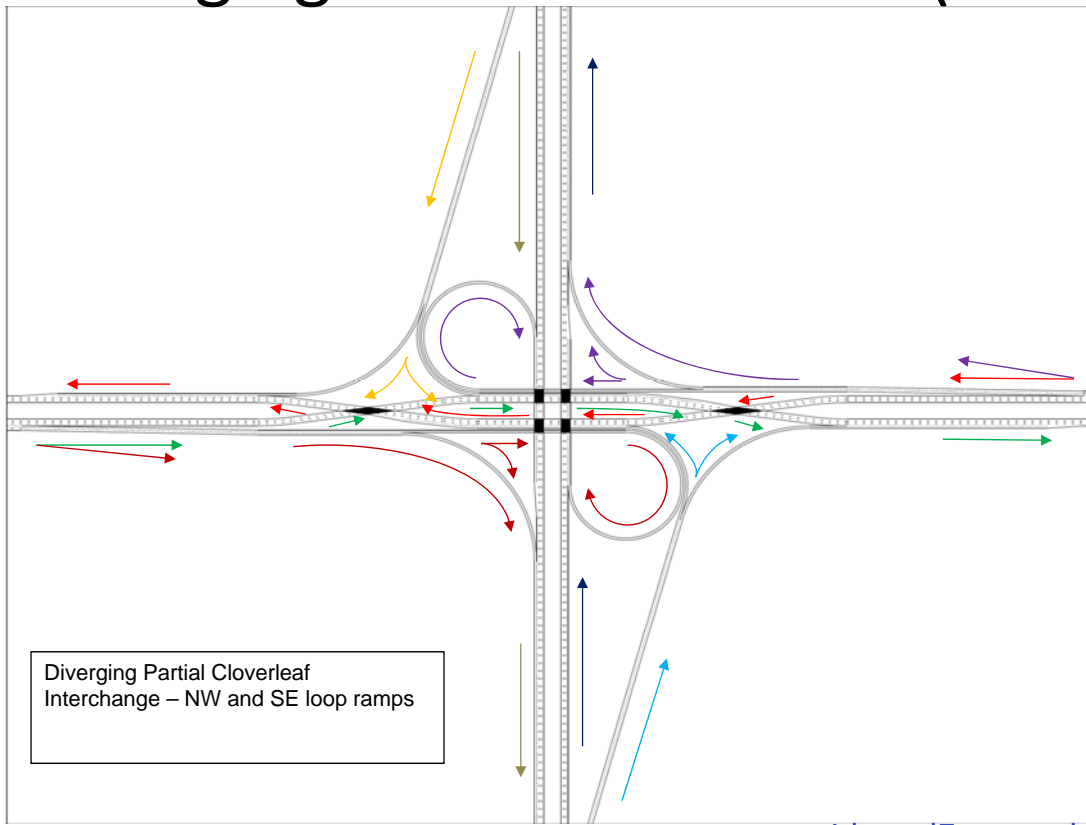
Left Side Ramps

- Advantages
 - Cost Savings
 - Lane Balancing
 - Thru Lane Continuity
 - Elimination of Weaving Concerns within the Interchange



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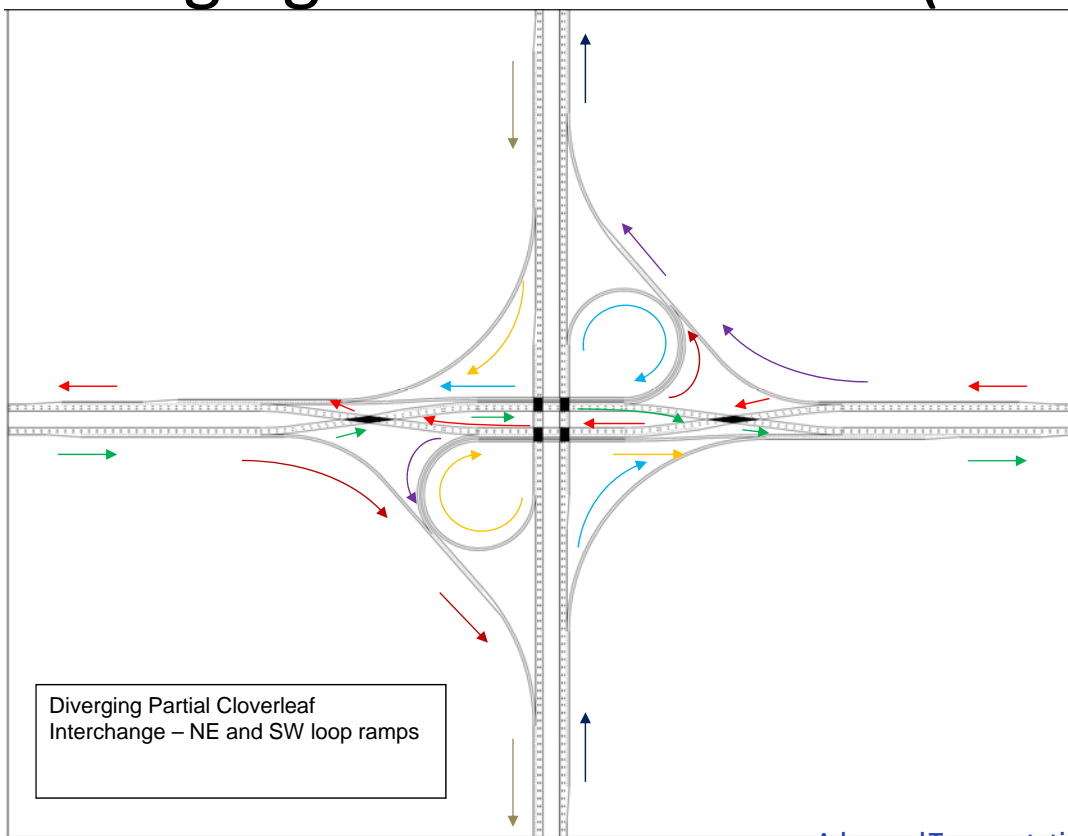
Diverging Partial Cloverleaf (DPC)



Diverging Partial Cloverleaf
Interchange – NW and SE loop ramps

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Diverging Partial Cloverleaf (DPC)

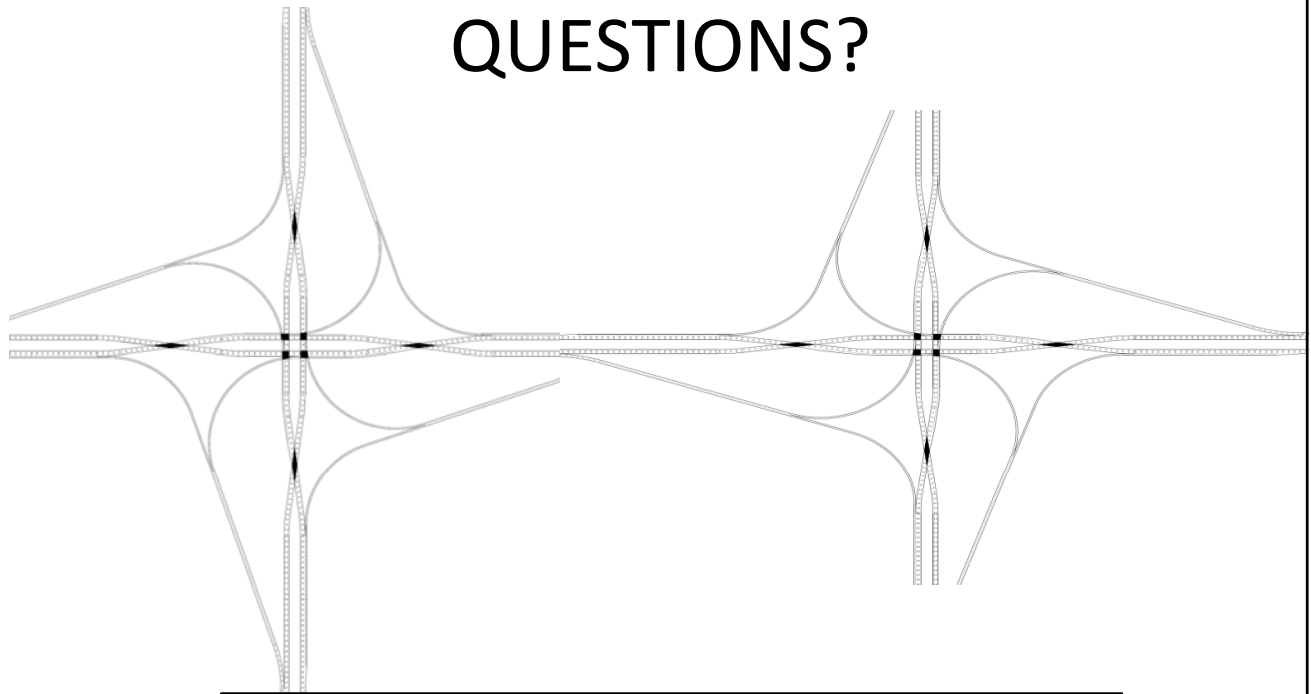


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Summary

- There are issues with our current system interchange forms
- The Diverging Windmill Interchange is another possible design to consider for system interchanges
- Need to reexamine the way we think about geometric design

QUESTIONS?



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