

QUASI-COUPLET: PRESERVING MOBILITY WHILE FREEING URBAN STREET SPACE

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What is a quasi-couplet?

- Also known as a “Unbalanced Flow Couplet” (UFC)
- Operation of parallel two-way streets as a one-way couplet with unbalanced lane configuration, i.e. one direction gets priority (with both laneage and signalization)

(View “An engineer’s guide to Q-couplets, Part 1” @ https://youtu.be/i07r7_ob55o for a 5 minute video introduction to the concept)

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Genesis of concept

- Redwood City, CA, first researched use of concept in 1960s
- Springfield, MO, adopted for Jefferson-Campbell corridor prior to 1975
- Springfield, IL, adopted for Washington-Monroe corridor in 1992
- Also examined or implemented by City of Portland, Oregon DOT, Utah DOT, Las Vegas, and San Francisco

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Case study: Springfield, IL

- CHALLENGE: Increase capacity of existing 2-way pair while minimizing disruption to the surrounding neighborhood and cost
 - 16 different concepts analyzed using TRANPLAN
 - Three final concepts analyzed: Do nothing; One-way couplet; Quasi-couplet

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Case study: Springfield, IL

- Simulation of “Do Nothing” with 40 percent growth
 - Significant queueing along couplet
- An engineer's guide to Q-couplets, Part 2

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Case study: Springfield, IL

- Simulation of “One Way Couplet” with 40 percent growth
- Queueing on streets perpendicular to couplet
- An engineer's guide to Q-couplets, Part 3

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Case study: Springfield, IL

- Simulation of “Quasi-couplet” with 40 percent growth
 - Minor queuing, if any, on any streets
 - An engineer's guide to Q-couplets, Part 4

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Advantages of Quasi-couplet: simplified signal phasing

Can convert multiphase signal timing to two phase –

- (1) maximize green time
- (2) Improve progression
- (3) Simpler operations
- (4) Overall improved corridor performance
- (5) Better pedestrian operations

(View “An engineer’s guide to Q-couplets, Part 5” @ <https://youtu.be/KICqZjw6aU0> & “An engineer’s guide to Q-couplets, Part 6” @ <https://youtu.be/WXG5xpHM1zE> for a comparison between multi-phase and two-phase signals)

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Advantages of Quasi-couplet:
the best of both worlds

- (1) Increased capacity like one-way
- (2) Maintain access like two-way
- (3) Better signal progression (one-way v two-way)
- (4) No need for indirect trips
- (5) No increase in U-turns on cross streets

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Advantages of Quasi-couplet: better use of existing space

- (1) Can create median pedestrian safe-zones
- (2) Can create bike lanes, transit lanes and other multi-modal facilities
- (3) Shared parking/driving lane depending on time of day



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Advantages of Quasi-couplet: better signalization

- (1) Creates bypass lanes so left-turns don't impede through traffic
- (2) Allows operation of two-phase signals
- (3) Can use one-way progression scheme



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Asheville: the NC Q-couplet proposal

- OBJECTIVE: Make Asheville more bicycle-friendly with the creation of bicycle lanes
- SOLUTION: Creation of a Q-couplet out of two parallel two-way facilities to free up pavement space for installation of bicycle lanes

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Asheville: the NC Q-couplet proposal

- ANALYSIS: The Q-couplet is a viable solution to the problem, along with a road diet and dropping a northbound lane on one of the two streets, and is worth a more in-depth study.

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Thank you!

Questions?

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