

# **Directory of 108 Four-Legged Service Interchange Concepts**

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Matrix of Symmetric Two-Level Concepts

Name = Known to be built and/or published; Letters = Promising new interchange; Blank = Likely no application potential

Tight means about 200 ft between ramp terminals, standard means about 600 ft, spread means about 1200 ft

| Lefts from fwy:<br>Lefts from<br>arterial | A.<br>Single<br>point | B.<br>Tight dia.          | C.<br>Std.<br>dia.  | D.<br>Spread<br>dia.             | E.<br>Tight<br>Contra-<br>flow | F.<br>Std.<br>Contra-<br>flow | G.<br>Spread<br>Contra-<br>flow | H.<br>Dis-<br>placed | I.<br>Loop      | J.<br>U-turn on<br>arterial            | K.<br>U-turn<br>over fwy. | L.<br>U-turn<br>over fwy.<br>w/ slip | M.<br>St. Aug.<br>u-turn |
|-------------------------------------------|-----------------------|---------------------------|---------------------|----------------------------------|--------------------------------|-------------------------------|---------------------------------|----------------------|-----------------|----------------------------------------|---------------------------|--------------------------------------|--------------------------|
| a. Single point                           | Single<br>point       |                           |                     | aaDD                             |                                |                               |                                 | aaHH                 |                 |                                        |                           |                                      |                          |
| b. Tight<br>diamond                       | bbAA                  | Tight dia.                |                     |                                  |                                |                               | bbGG                            | bbHH                 |                 | bbJJ                                   | bbKK                      |                                      |                          |
| c. Std.<br>diamond                        |                       |                           | Std.<br>dia.        |                                  |                                | ccFF                          |                                 |                      |                 | Super-<br>street<br>ddJJ               |                           | cLL                                  | ccMM                     |
| d. Spread<br>diamond                      | Three<br>point        | ddBB                      |                     | Spread<br>dia.<br>Offset<br>dia. |                                |                               |                                 | ddHH                 | Parclo B        |                                        |                           |                                      |                          |
| e. Tight<br>contraflow                    |                       |                           |                     |                                  |                                |                               |                                 |                      |                 | Synchro-<br>nized                      |                           |                                      |                          |
| f. Std.<br>contraflow                     |                       |                           | Contra-<br>flow     |                                  |                                | Super<br>DDI                  | ggGG                            |                      | Folded          |                                        |                           | Milwaukee<br>B                       |                          |
| g. Spread<br>contraflow                   | ggAA                  | ggBB                      |                     |                                  |                                |                               |                                 |                      |                 |                                        |                           |                                      |                          |
| h. Displaced                              | hhAA                  | hhBB                      | Displaced<br>left   | hhDD                             |                                | hhFF                          |                                 | hhHH                 | CFI             |                                        |                           |                                      |                          |
| i. Loop                                   |                       |                           |                     | Parclo<br>A                      |                                |                               | Parclo<br>ProgressA             | iiHH                 | Clover-<br>leaf | iiJJ                                   |                           |                                      | iiMM                     |
| j. U-turn on<br>arterial                  | jjAA                  | Median u-<br>turn on art. | jjCC                |                                  |                                | jjFF                          |                                 |                      |                 | Signalized<br>FRE<br>(Same as<br>jjKK) | jjKK                      | jjLL                                 |                          |
| k. U-turn over<br>fwy.                    |                       | Median u-<br>turn         |                     |                                  |                                |                               |                                 |                      |                 |                                        | kkKK                      | kkLL                                 |                          |
| l. U-turn over<br>fwy. w/ slip<br>ramp    |                       | llBB                      | Milwaukee<br>A      |                                  |                                | llFF                          |                                 |                      | I-41            | llJJ                                   | llKK                      | W                                    |                          |
| m. St. Aug.<br>u-turn                     | mmAA                  | mmBB                      | St. Aug. u-<br>turn |                                  |                                | mmFF                          |                                 |                      |                 |                                        |                           |                                      | mmMM                     |
| n. Split<br>diamond                       |                       | nnBB                      | Split<br>diamond    |                                  | nnEE                           | nnFF                          |                                 |                      |                 |                                        | nnKK                      | nnLL                                 |                          |

## Interchange Concept Scoring Criteria

We judged interchange concepts in 11 categories. Within each category we used a scale of zero to five points, with zero representing the poorest quality of service and five representing the best.

### Capacity

- 5) Arterial AADT at capacity = 42667 vpd (L+T, 2 phases)
- 4) Arterial AADT at capacity = 32000 vpd (2L+T, 2 phases)
- 3) Arterial AADT at capacity = 30000 vpd (2L+T, 3 phases)
- 2) Arterial AADT at capacity = 25600 vpd (3L+T, 2 phases)
- 1) Arterial AADT at capacity = 24000 vpd (3L+T or L+2T, 3 phases)
- 0) Arterial AADT at capacity = 21333 vpd or lower (4L+T or 2L+2T, 3 or 4 phases)

### Quality of Progression

- 5) Number of full signals = 0
- 4) Number of full signals = 1, Number of phases = 2
- 3) Number of full signals = 1, Number of phases = 3
- 2) Number of full signals = 1, Number of phases = 4
- 1) Number of full signals = 2, Number of phases = 2 or 2.5 (T intersection)
- 0) Number of full signals = 2, Number of phases = 3

### Extra Distance Travelled

- 5) Total = 800 ft or lower
- 4) Total = 801 to 2000 ft
- 3) Total = 2001 to 3000 ft
- 2) Total = 3001 to 4000 ft
- 1) Total = 4001 to 6000 ft
- 0) Total = 6001 ft or higher

### Right of Way

- 5) Total = 200,000 sf or lower
- 4) Total = 200,001 to 400,000 sf
- 3) Total = 400,001 to 600,000 sf
- 2) Total = 600,001 to 800,000 sf
- 1) Total = 800,001 to 1,000,000 sf
- 0) Total = 1,000,001 sf or higher

### Extent Along Freeway

- 5) Total = 2000 ft or lower
- 4) Total = 2001 to 2700 ft
- 3) Total = 2701 to 3600 ft
- 2) Total = 3601 to 5000 ft
- 1) Total = 5001 to 7000 ft
- 0) Total = 7001 ft or higher

Extent Along Arterial

- 5) Total = 400 ft or lower
- 4) Total = 401 to 800 ft
- 3) Total = 801 to 1200 ft
- 2) Total = 1201 to 1600 ft
- 1) Total = 1601 to 2000 ft
- 0) Total = 2001 ft or higher

Bridge Size

- 5) Total = 14,000 sf or lower
- 4) Total = 14,001 to 16,000 sf
- 3) Total = 16,001 to 18,000 sf
- 2) Total = 18,001 to 20,000 sf
- 1) Total = 20,001 to 22,000 sf
- 0) Total = 1,000,001 sf or higher

Wrong Way Potential

- 5) Five "no" values on questions regarding potential wrong way movements
- 4) Four "no" values
- 3) Three "no" values
- 2) Two "no" values
- 1) One "no" values
- 0) Zero "no" values

Unusual Maneuvers

- 5) Total = 0
- 4) Total = 1 or 2
- 3) Total = 3 or 4
- 2) Total = 5 or 6
- 1) Total = 7 or 8
- 0) Total = 9 or more

Conflict Points

- 5) Weighted Total = 10 or lower
- 4) Weighted Total = 11 to 14
- 3) Weighted Total = 15 to 18
- 2) Weighted Total = 19 to 22
- 1) Weighted Total = 23 to 26
- 0) Weighted Total = 11 to 14

Crossing Pedestrians

- 5) Weighted Total = 2 crossings or lower
- 4) Weighted Total = 3 to 4
- 3) Weighted Total = 5 to 6
- 2) Weighted Total = 7 to 8
- 1) Weighted Total = 9 to 10
- 0) Weighted Total = 11 or higher

Subtract one point for any design that causes pedestrians to have to walk more than 500 feet longer than the straight line distance.

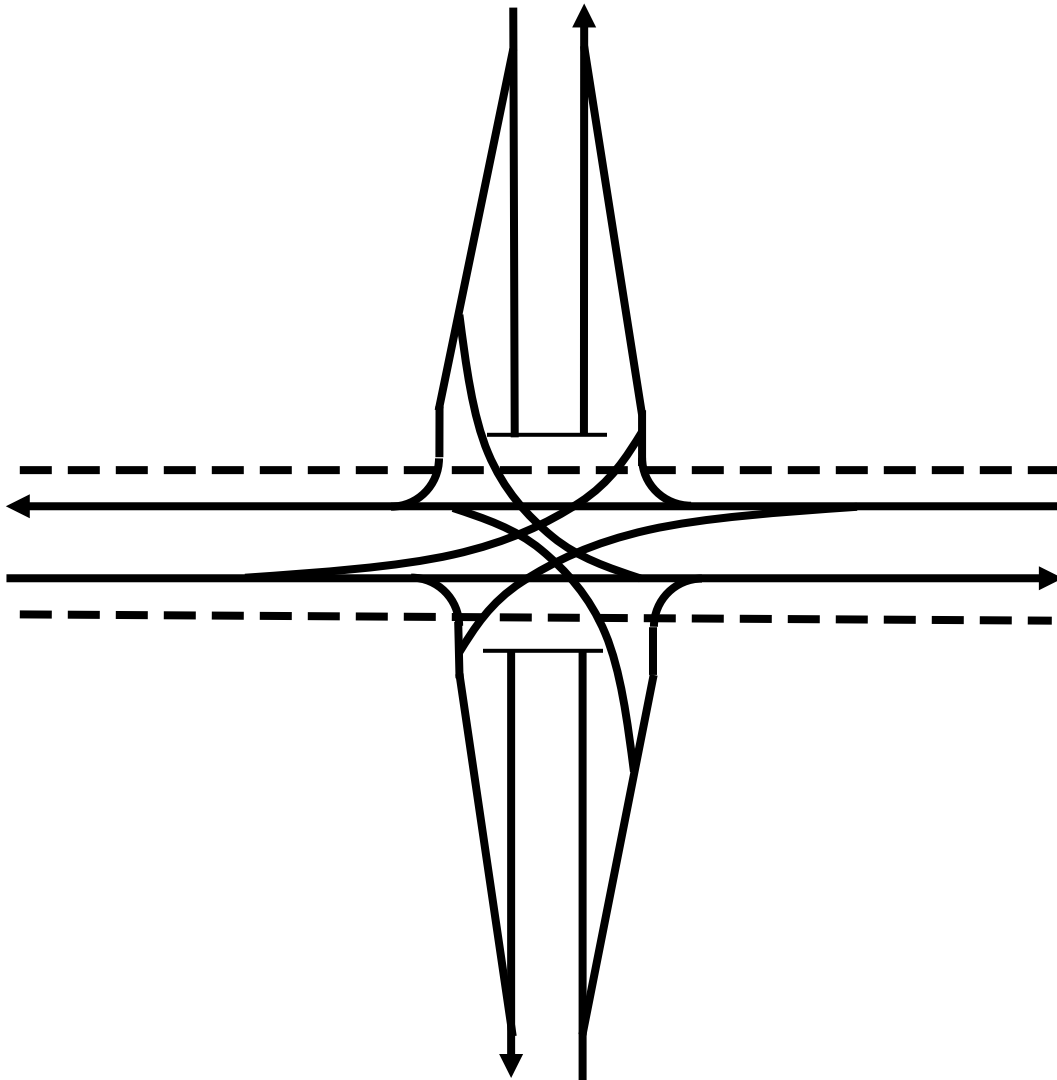
## aaAA, Single Point (SPUI)

**Summary:** Supplies good efficiency in a small right of way. Requires a large bridge and results in a large number of conflict points.

**History:** Invented in the 1960s, spread slowly through the 1970s and 1980s, installed at a steady pace during the 1990s. Now common, typically at high-demand spots with tight right of way.

**Rank:** 47 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 3           | 5                 | 0               | 3                 | 2                   | 2                  | 0           | 5                 | 5                    | 5                     | 11                 | 7              | 15           | 33            |



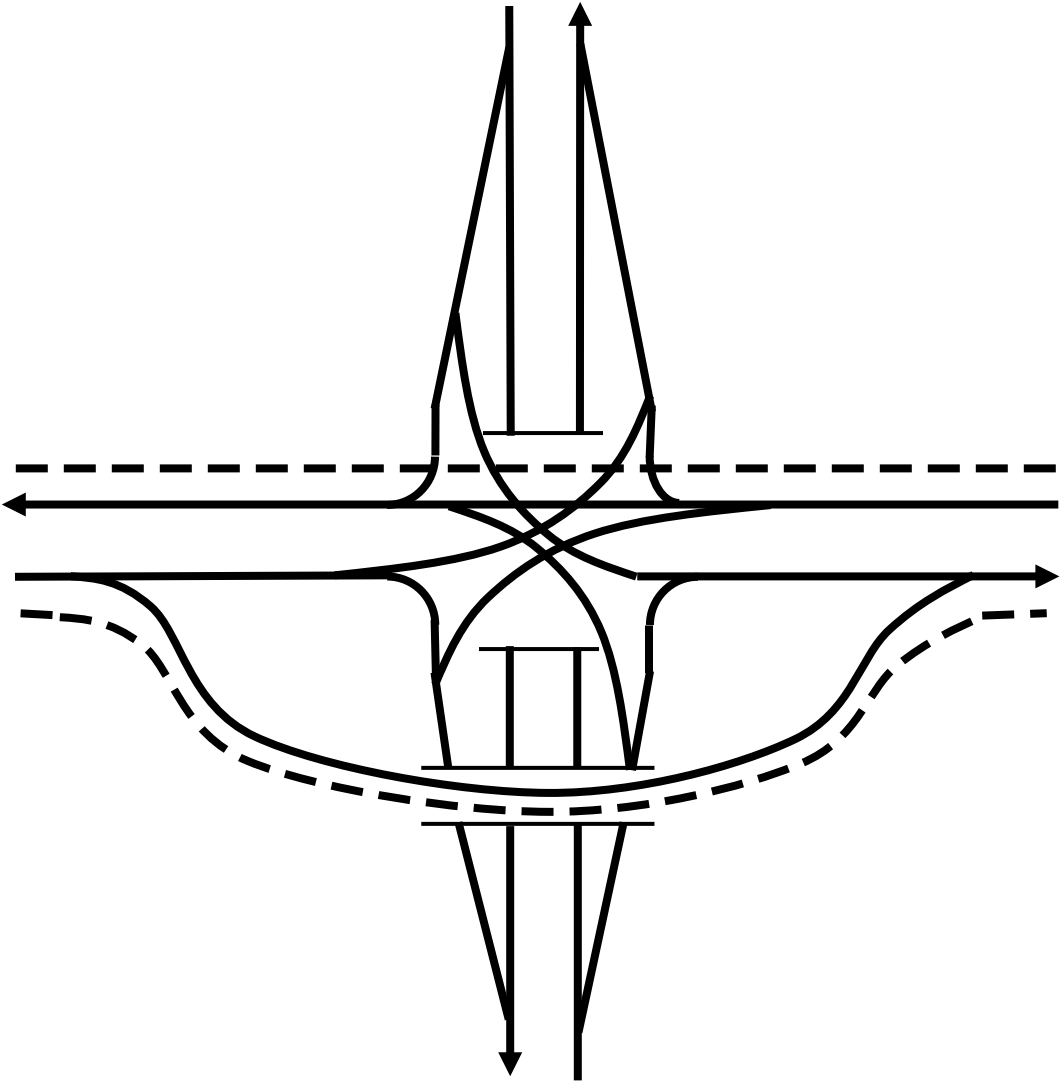
## aaAA, Single Point with One-Way Bypass

**Summary:** Provides good efficiency but requires a large bridge with an additional bypass bridge. Also has a large number of conflict points.

**History:** This is a new design.

**Rank:** 25 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 5           | 4                 | 1               | 4                 | 3                   | 3                  | 0           | 3                 | 5                    | 4                     | 12                 | 11             | 12           | 35            |



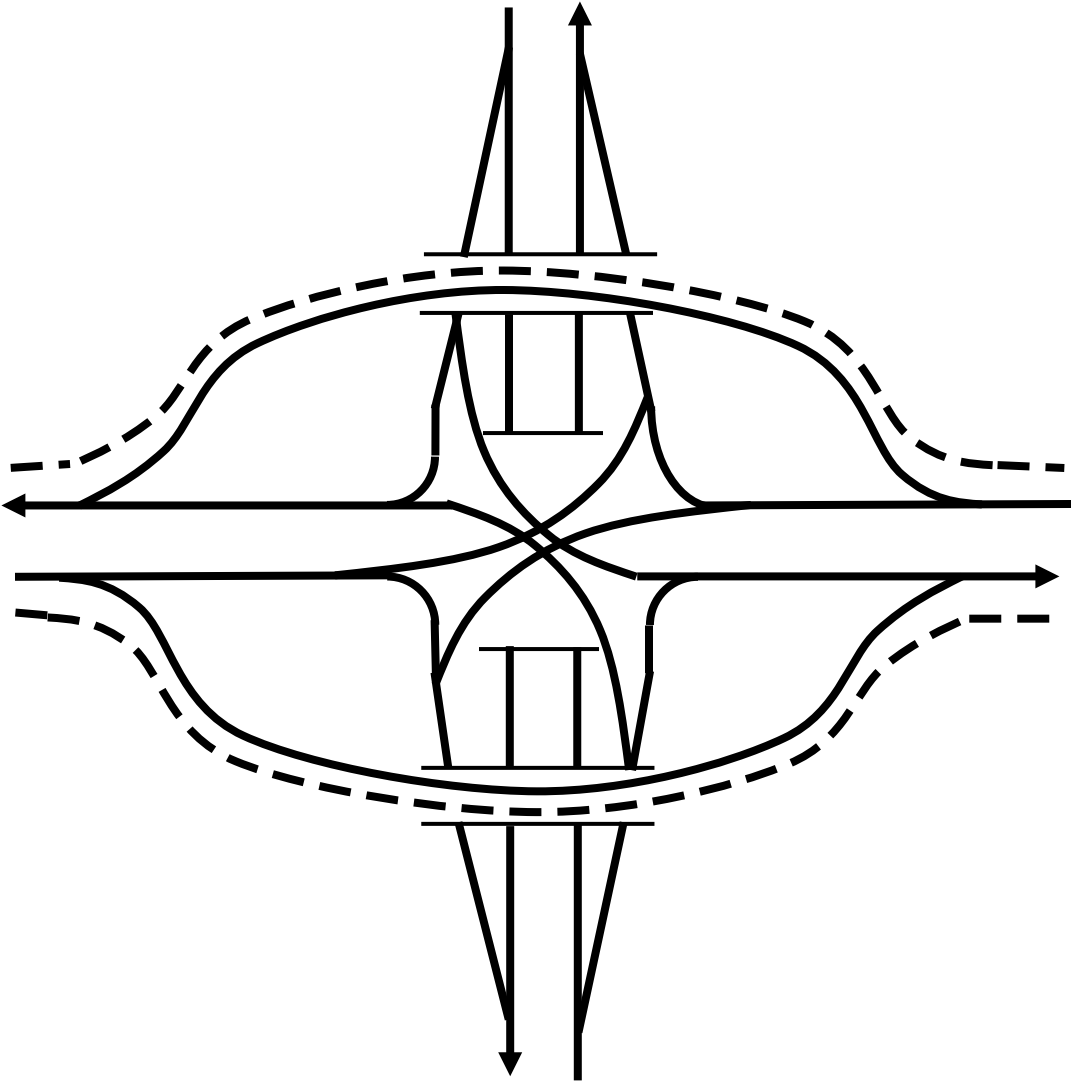
# aaAA, Single Point with Two One-Way Bypasses

**Summary:** Provides good efficiency but requires a large bridge and two additional bypass bridges.  
Could be a retrofit for an over-capacity single point interchange.

**History:** This is a new design.

**Rank:** 24 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 2                 | 2               | 4                 | 3                   | 4                  | 0           | 2                 | 5                    | 3                     | 12                 | 13             | 10           | 35            |





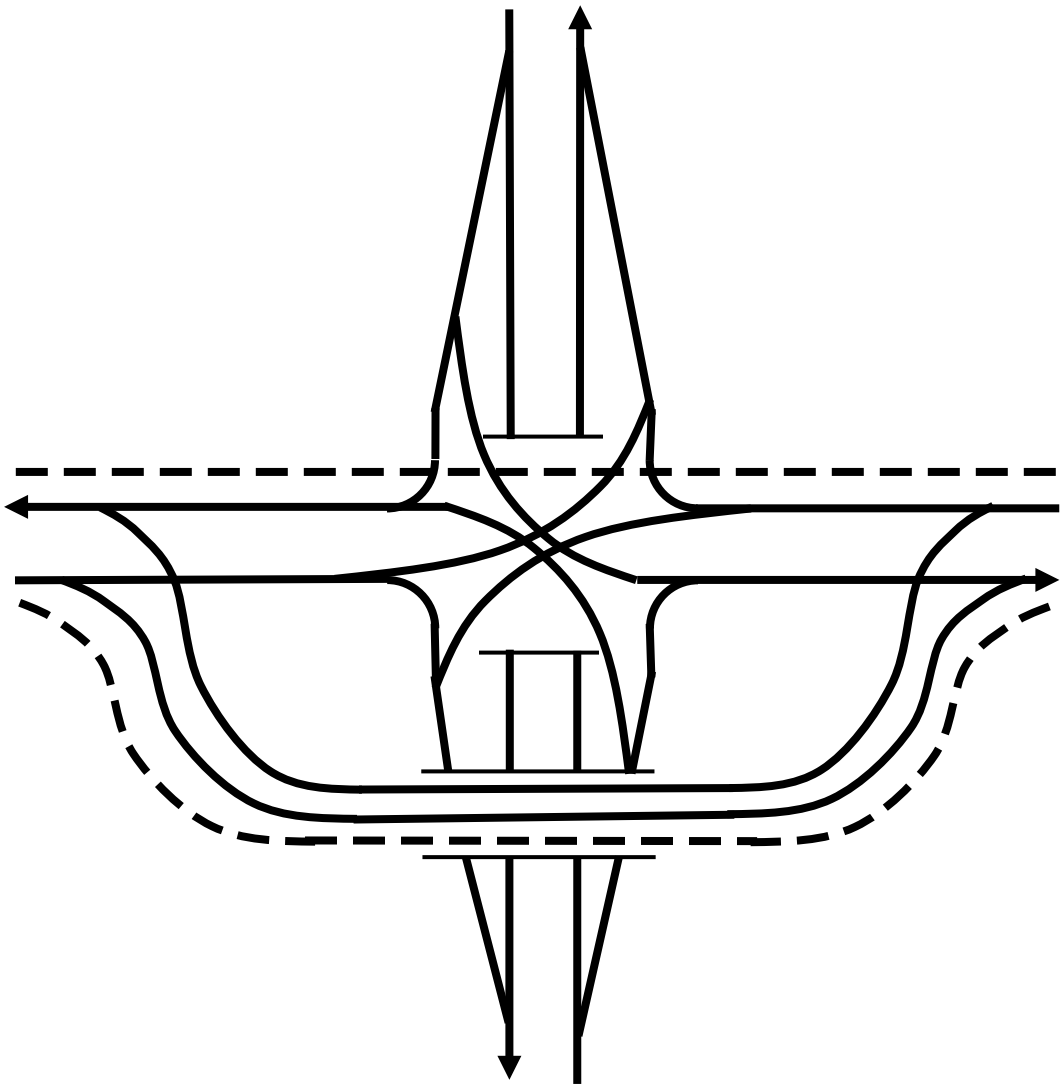
## aaAA, Single Point with Two-Way Bypass

**Summary:** Provides average efficiency, safety, and cost performance. Requires a large bridge and results in a large number of conflict points but has a small extent along the freeway.

**History:** This is a new design.

**Rank:** 55 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 2                 | 1               | 4                 | 3                   | 3                  | 0           | 3                 | 5                    | 3                     | 10                 | 11             | 11           | 32            |



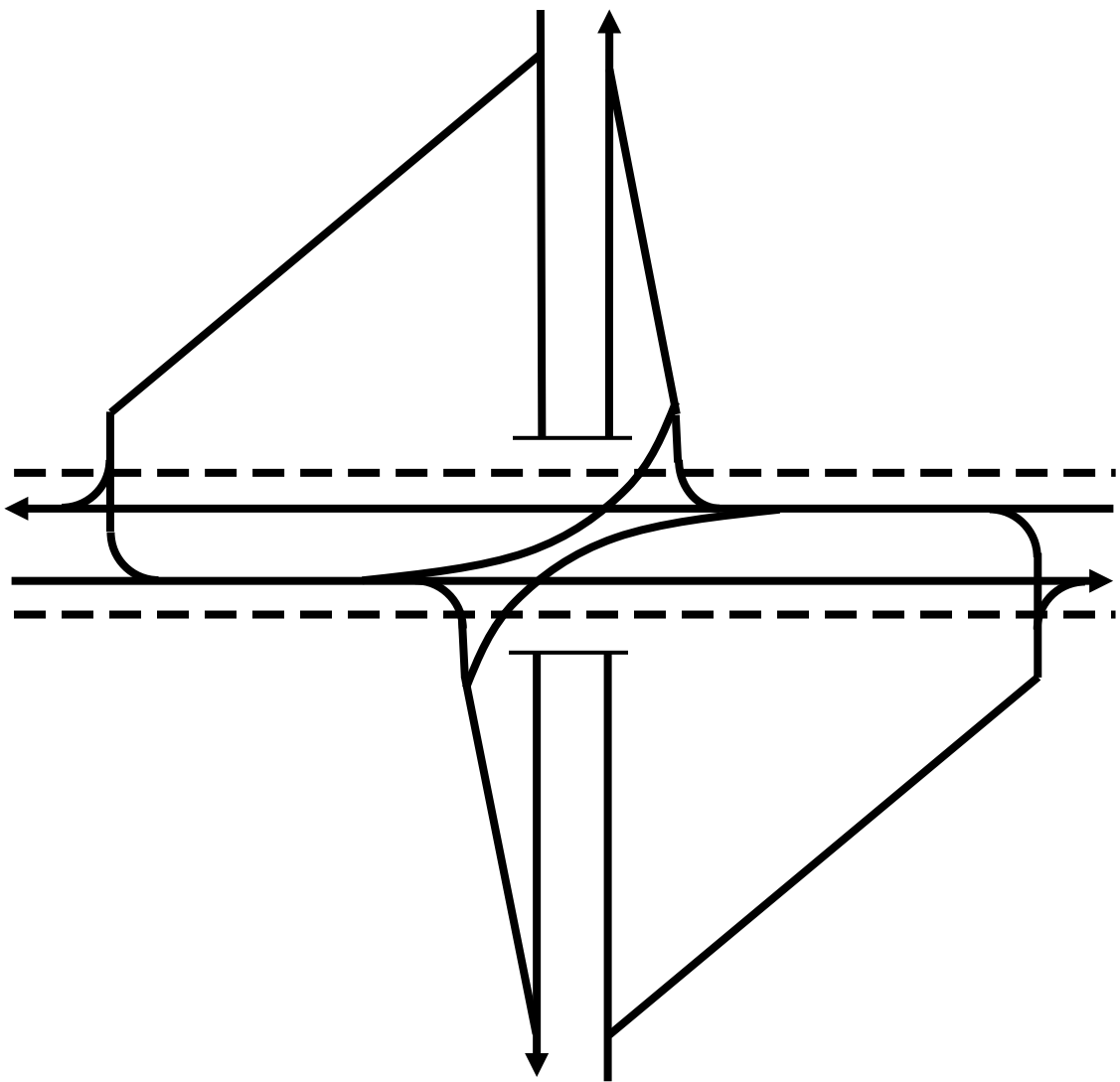
# aaDD, Single Point Spread Diamond

**Summary:** Supplies average efficiency, safety, and cost performance. Provides benefits in capacity and distance traveled but has poor progression.

**History:** This is a new design.

**Rank:** 69 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 1           | 4                 | 2               | 4                 | 3                   | 2                  | 2           | 4                 | 3                    | 2                     | 9                  | 11             | 11           | 31            |



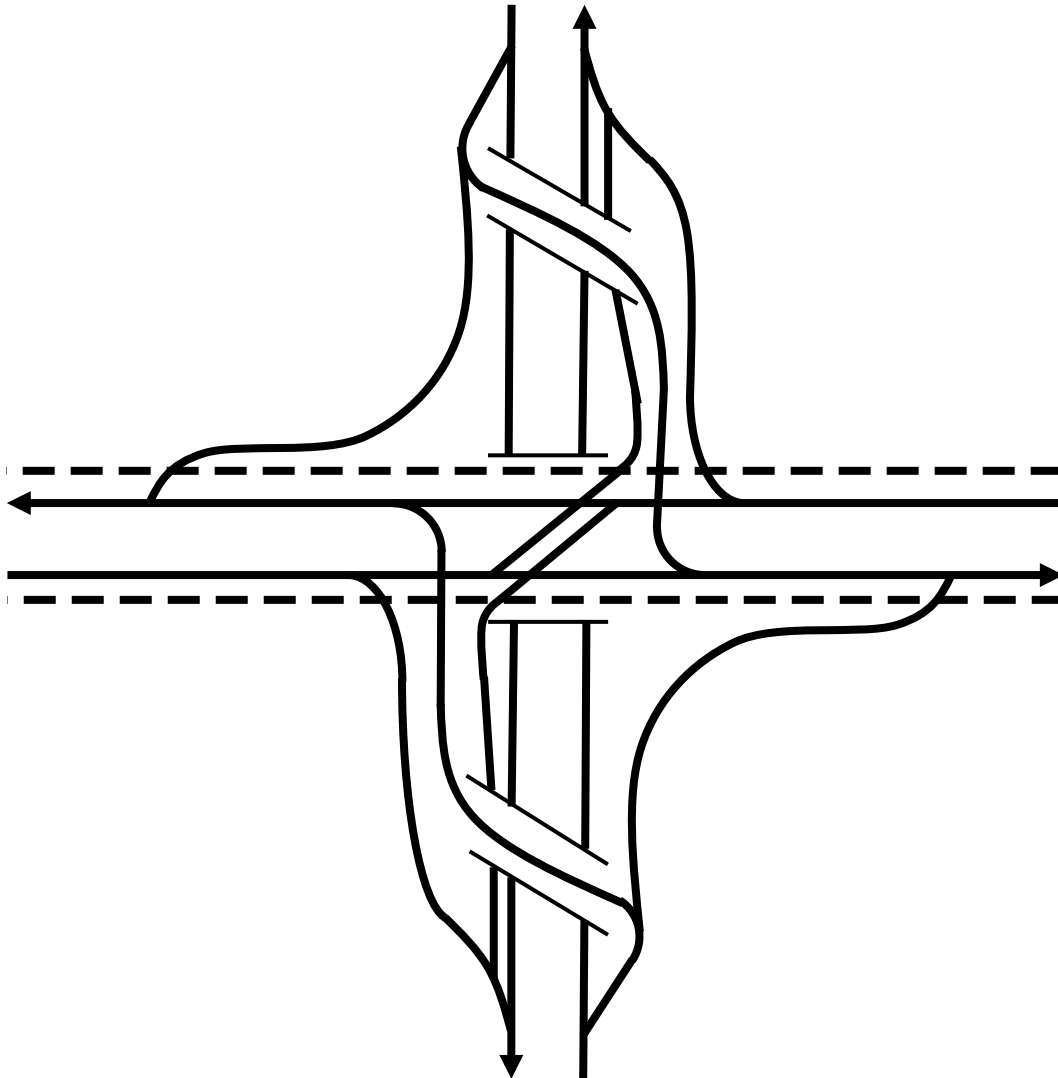
## aaHH, Single Point Displaced

**Summary:** Provides great efficiency and good safety benefits, but requires a large bridge and extensive right of way with a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 54 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 4           | 5                 | 2               | 4                 | 2                   | 4                  | 0           | 2                 | 1                    | 3                     | 14                 | 12             | 6            | 32            |



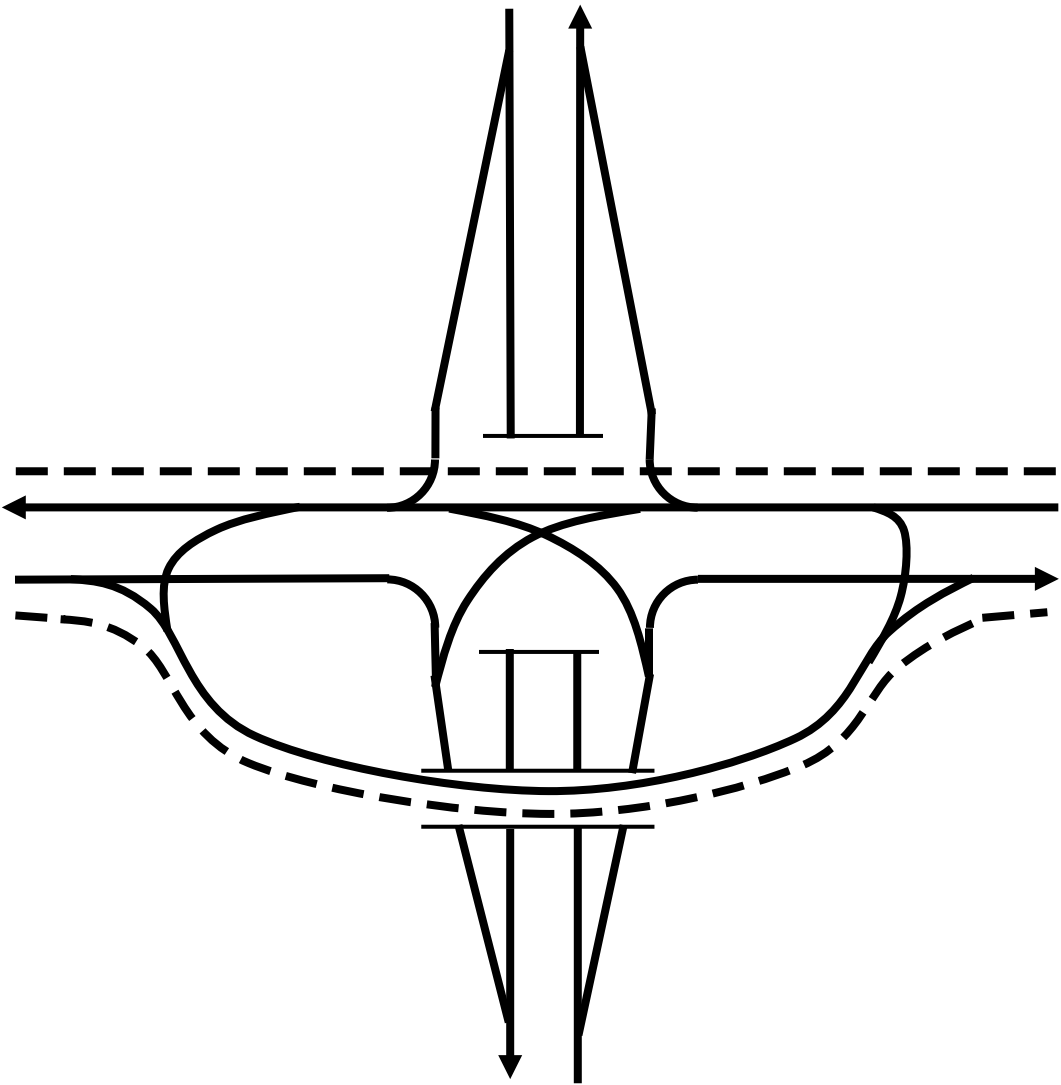
### ajAJ, Half Single Point

**Summary:** Provides good cost scores and performs well in safety, but has low capacity and adds significant travel distances.

**History:** This is a new design.

**Rank:** 29 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 5           | 1                 | 3               | 3                 | 3                   | 4                  | 2           | 4                 | 5                    | 3                     | 7                  | 13             | 14           | 34            |



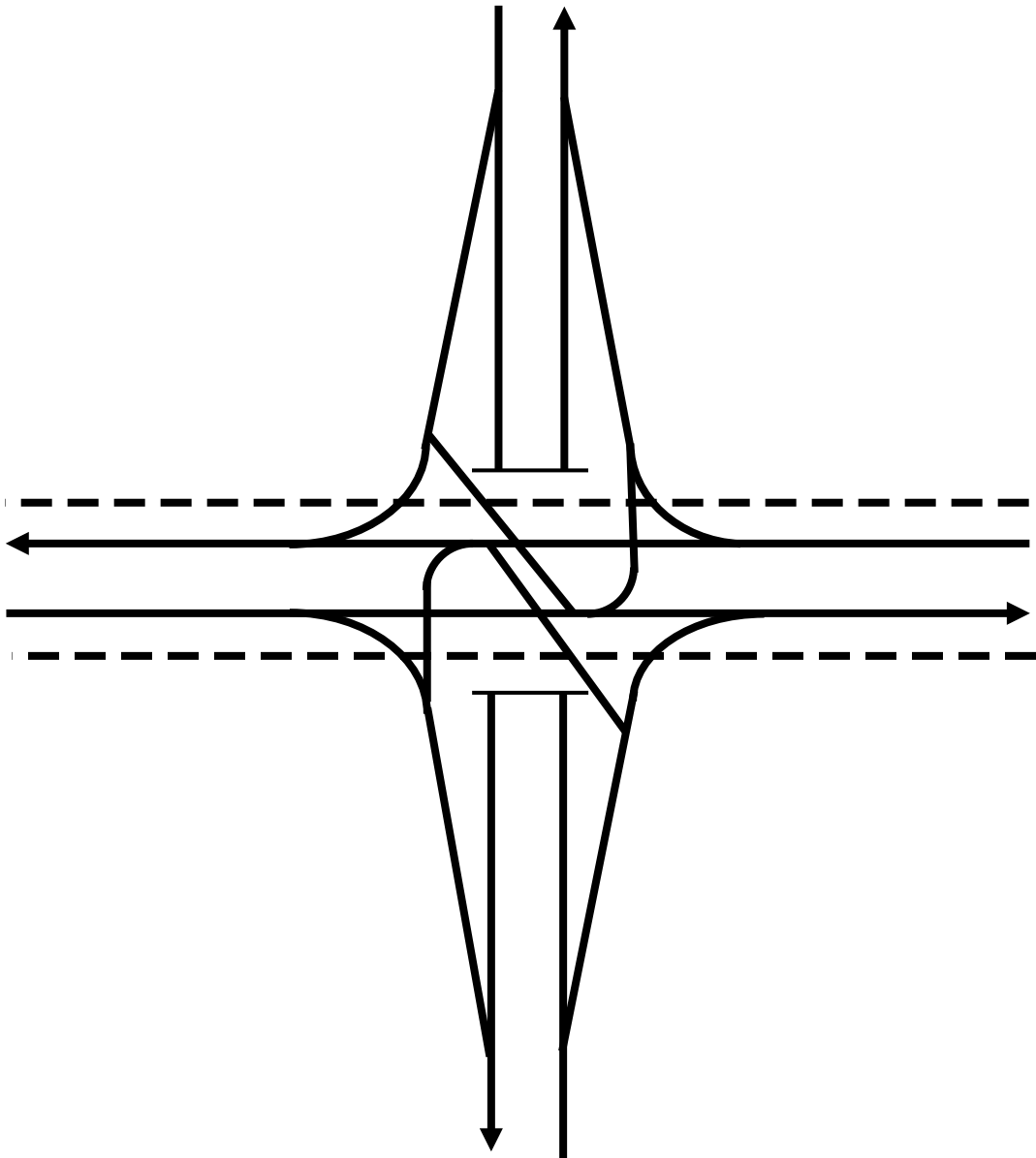
bbAA, Tight Diamond Single Point

**Summary:** Provides great cost scores. Adds minimal extra travel distance and is great for pedestrians, but has high wrong way potential.

**History:** This is a new design.

**Rank:** 12 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 5                 | 2               | 4                 | 1                   | 5                  | 2           | 5                 | 5                    | 5                     | 9                  | 12             | 17           | 38            |



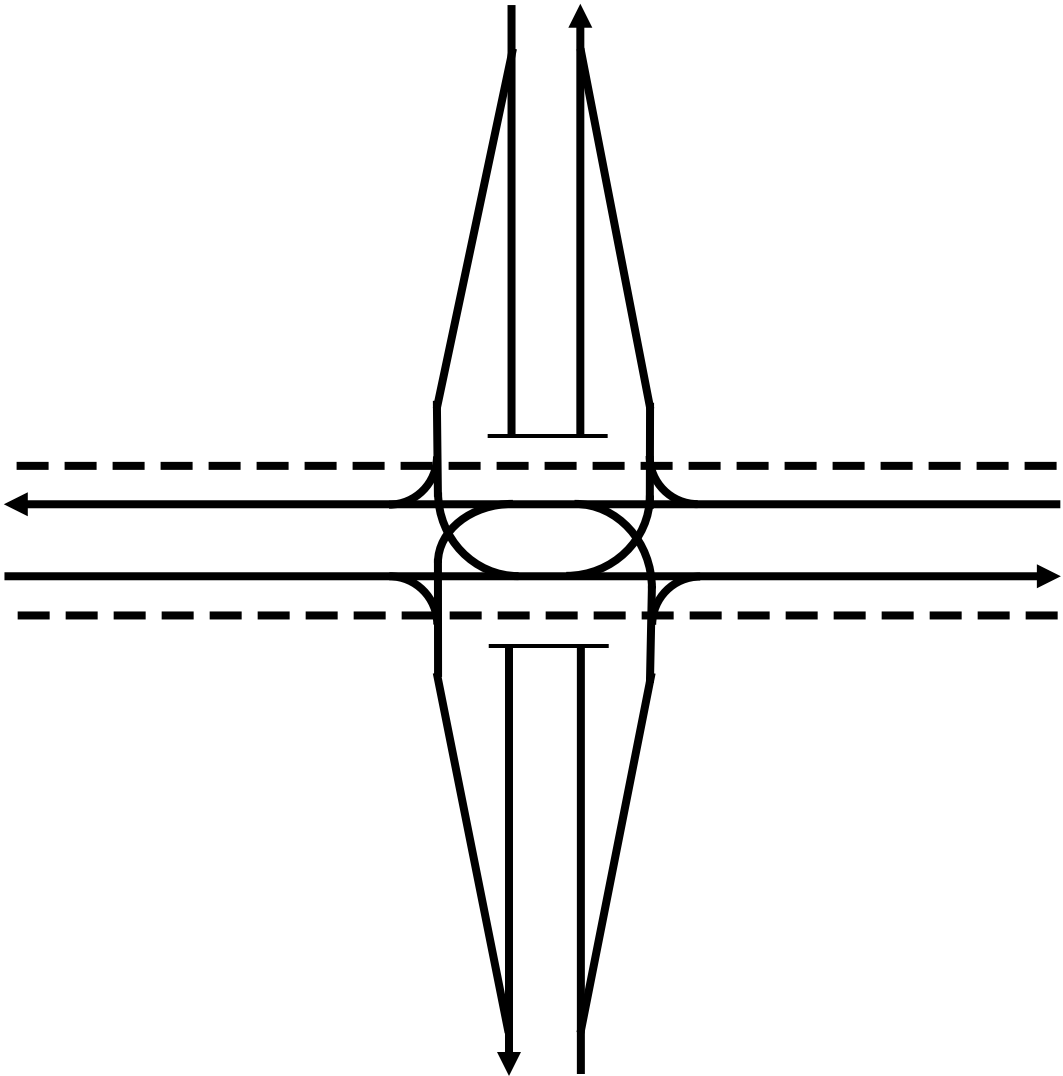
# bbBB, Tight Diamond

**Summary:** Meets ideal cost criteria and has good safety performance. Has great pedestrian performance and few unusual maneuvers, but poor capacity.

**History:** Many of tight diamonds are in place in the US. They seem to be growing in popularity due to the low cost.

**Rank:** 6 of 108.

|          |             |                   |                 |                   |                     |                    |             |                   |                      |                       |                    |                |              |               |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
| 0        | 2           | 5                 | 1               | 4                 | 3                   | 5                  | 5           | 5                 | 5                    | 5                     | 7                  | 13             | 20           | 40            |



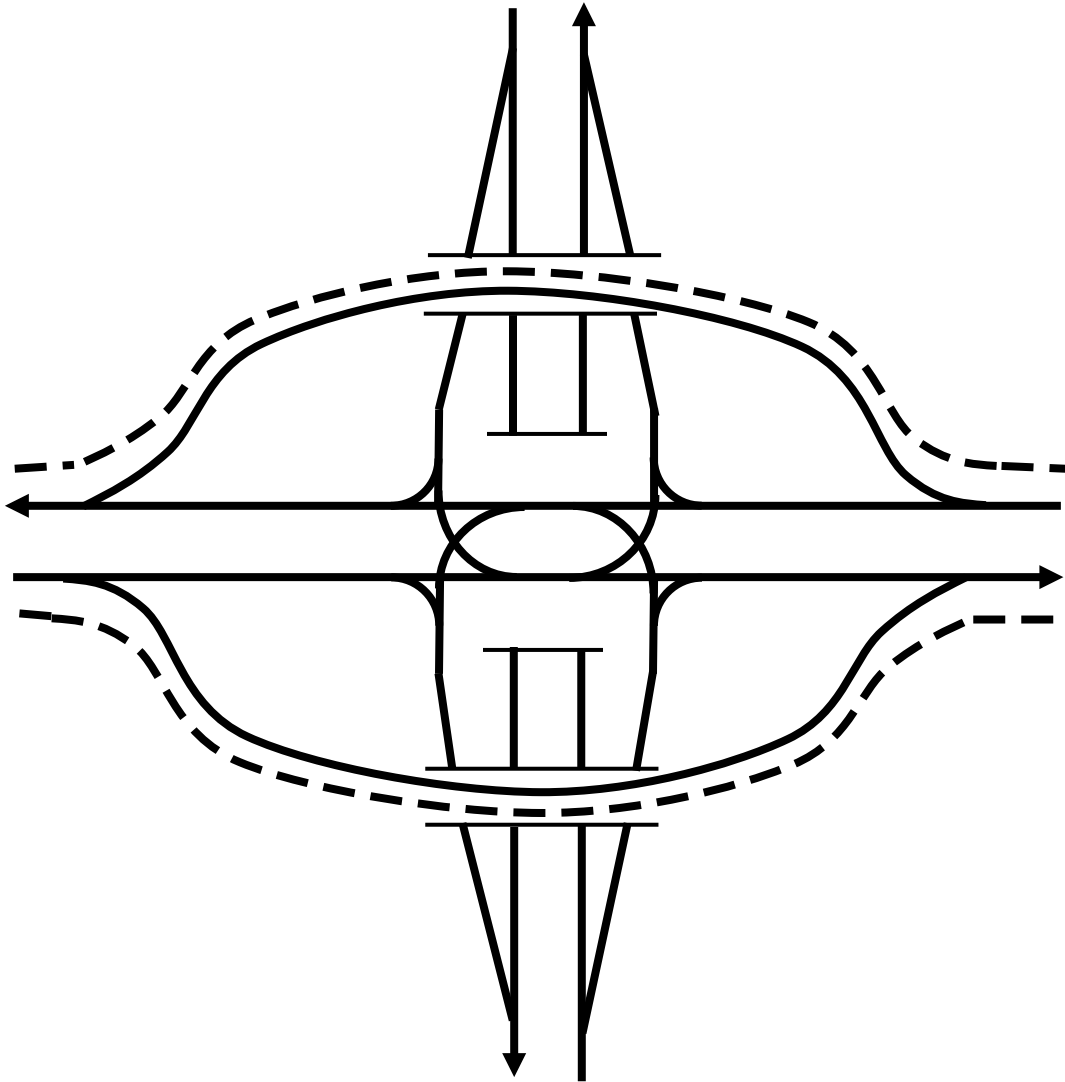
## bbBB, Tight Diamond with Two One-Way Bypasses

**Summary:** Provides good efficiency and good cost scores, but requires two bypass bridges and results in a large number of conflict points. It could be a retrofit for an over-capacity tight diamond.

**History:** This is a new design.

**Rank:** 19 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 2                 | 0               | 4                 | 2                   | 4                  | 4           | 2                 | 5                    | 3                     | 12                 | 10             | 14           | 36            |



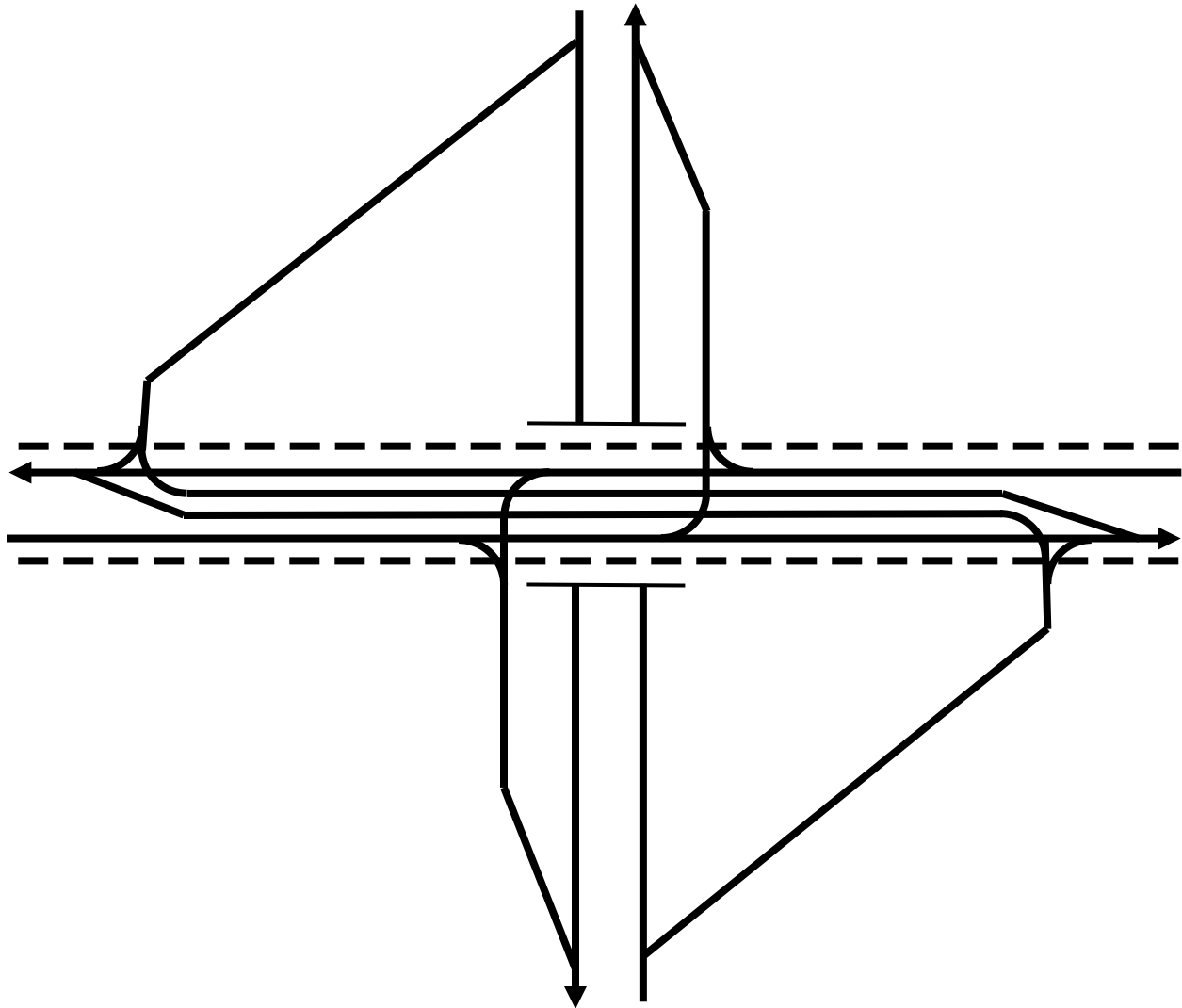
## bbGG, Tight Diamond Spread Contraflow

**Summary:** Provides good efficiency in a small right of way. Requires a large bridge and results in a large number of conflict points. It could be a retrofit for a parclo A.

**History:** This is a new design.

**Rank:** 31 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 3           | 4                 | 0               | 4                 | 4                   | 4                  | 1           | 4                 | 4                    | 2                     | 11                 | 12             | 11           | 34            |





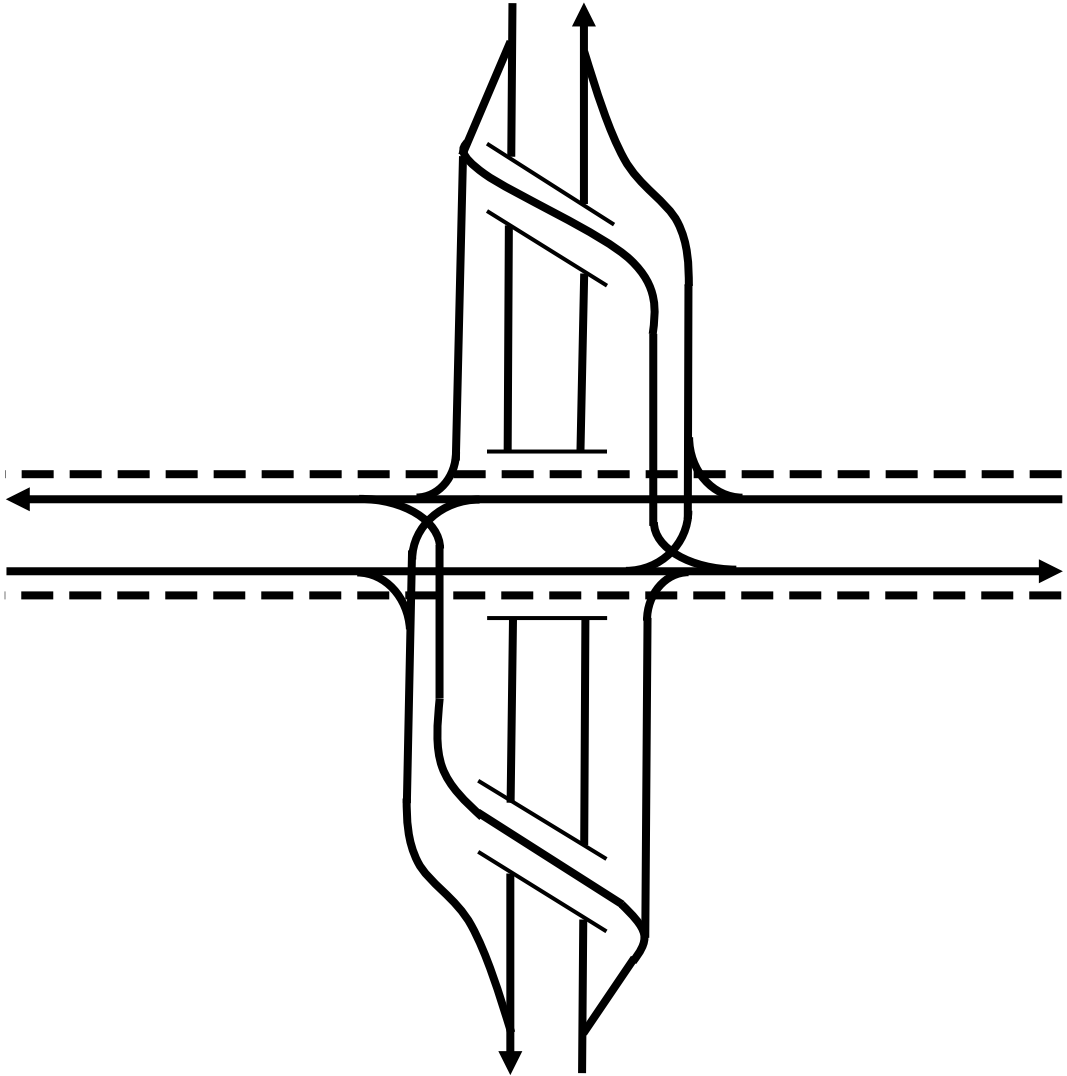
# bbHH, Tight Diamond Displaced

**Summary:** Provides good safety benefits. This design is great for pedestrians and has a low amount of unusual maneuvers. However, it also has low capacity, a high number of conflict points, and a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 32 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 5                 | 1               | 5                 | 2                   | 5                  | 2           | 4                 | 1                    | 5                     | 9                  | 13             | 12           | 34            |



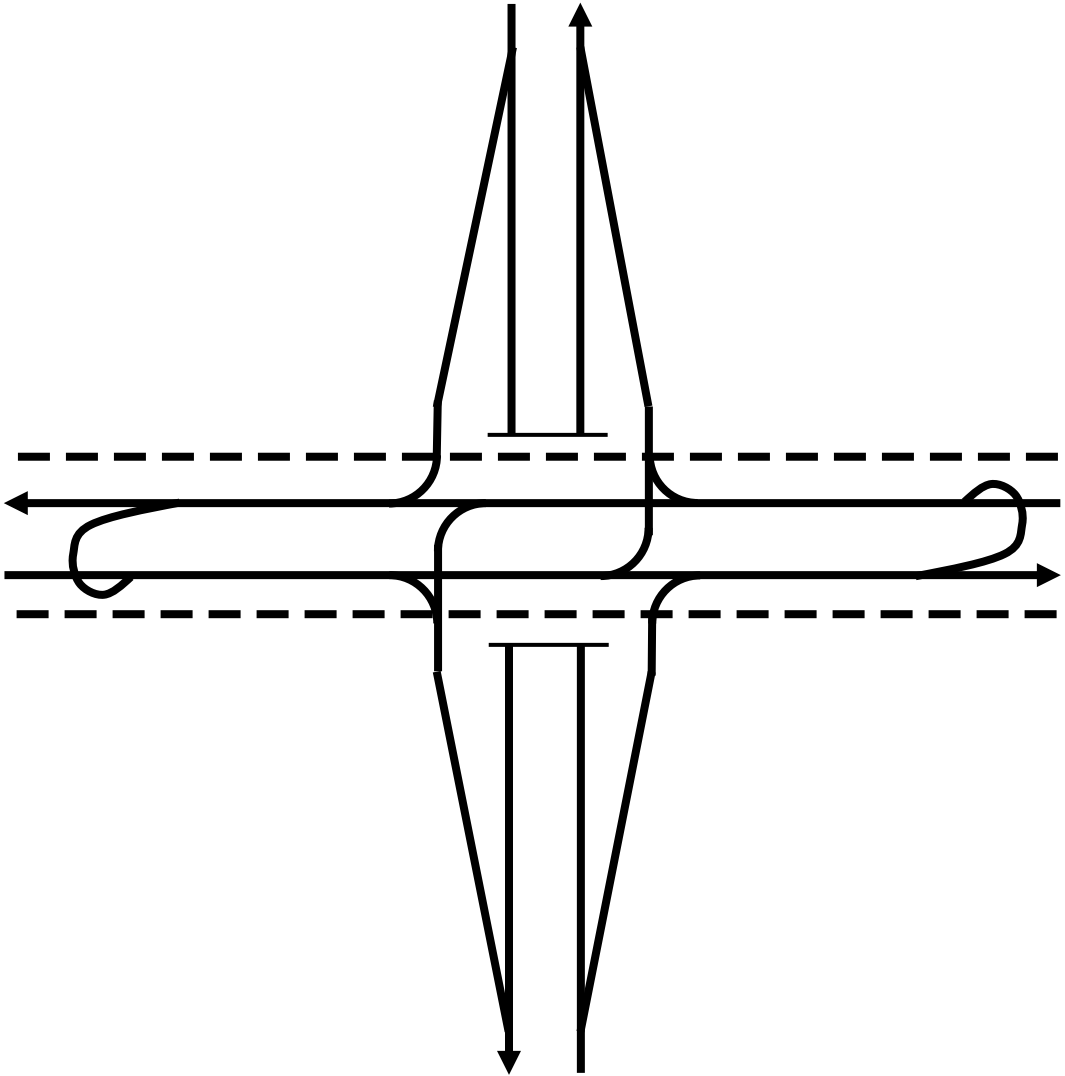
bbJJ, Tight Diamond U-Turn on Arterial

**Summary:** Provides great cost scores with good safety performance. Has poor capacity. In a low-demand spot if there is room for the u-turn crossovers this could compete with the tight diamond.

**History:** This is a new design.

**Rank:** 3 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 0        | 4           | 3                 | 3               | 3                 | 4                   | 5                  | 5           | 5                 | 5                    | 4                     | 7                  | 15             | 19           | 41            |



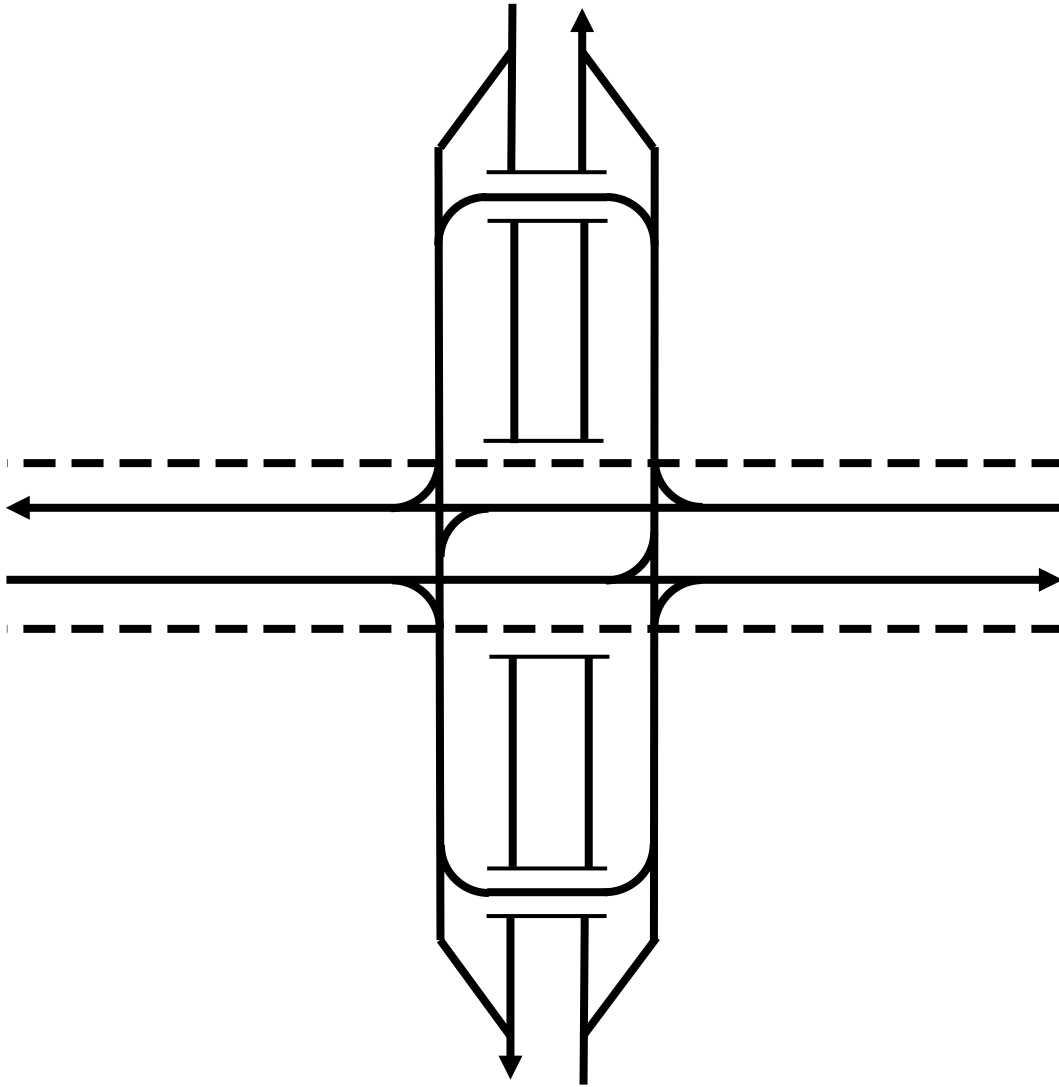
## bbKK, Tight Diamond U-Turn over Freeway

**Summary:** Provides good cost scores but has low capacity and a large number of conflict points.

**History:** This is a new design.

**Rank:** 71 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 3                 | 1               | 2                 | 2                   | 5                  | 3           | 4                 | 2                    | 5                     | 7                  | 10             | 14           | 31            |



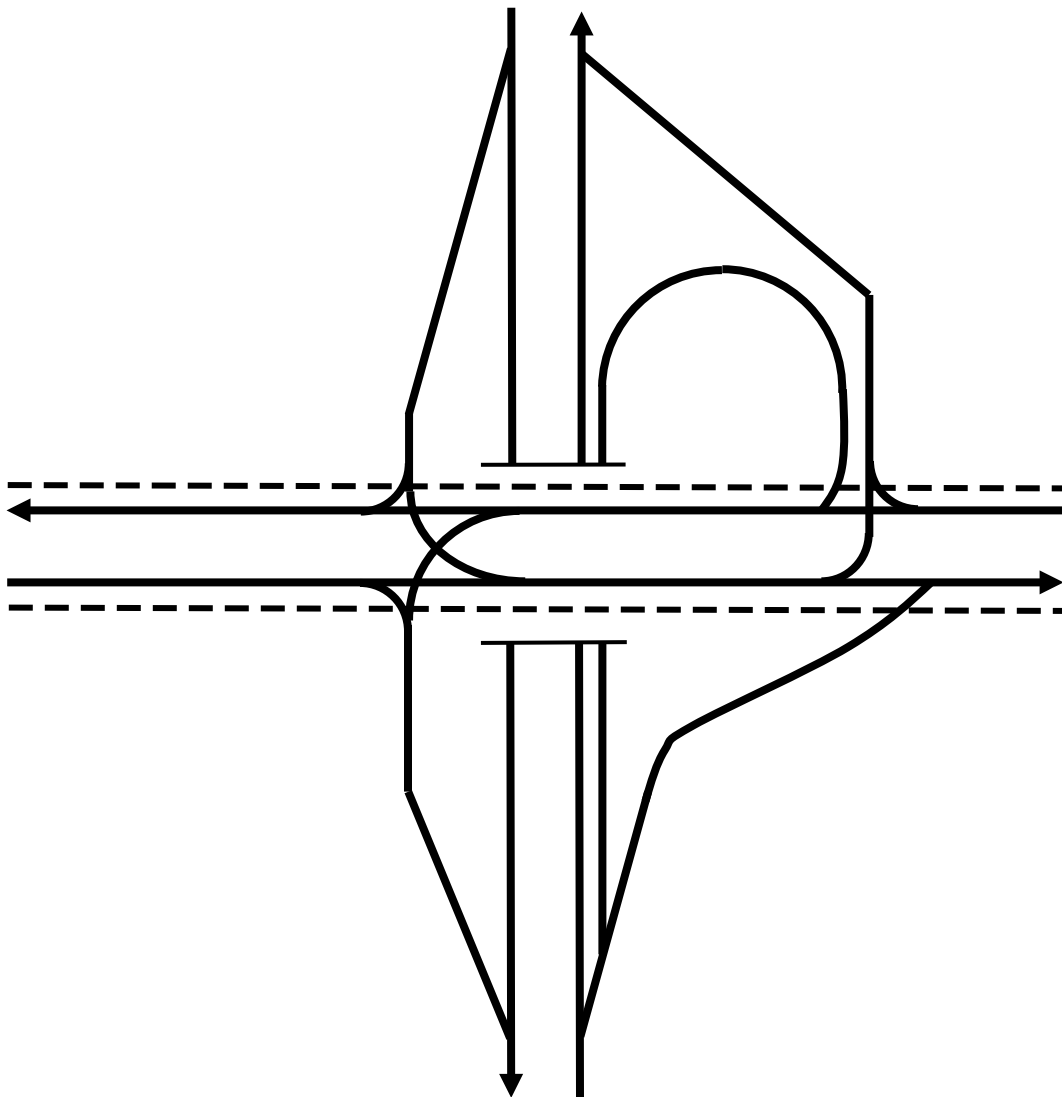
## bdBI, One Loop B

**Summary:** Provides good safety performance with a small bridge but has low capacity and requires a lengthy extent along the arterial.

**History:** This is a relatively rare design.

**Rank:** 57 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 2                 | 2               | 5                 | 4                   | 4                  | 4           | 3                 | 3                    | 1                     | 6                  | 15             | 11           | 32            |



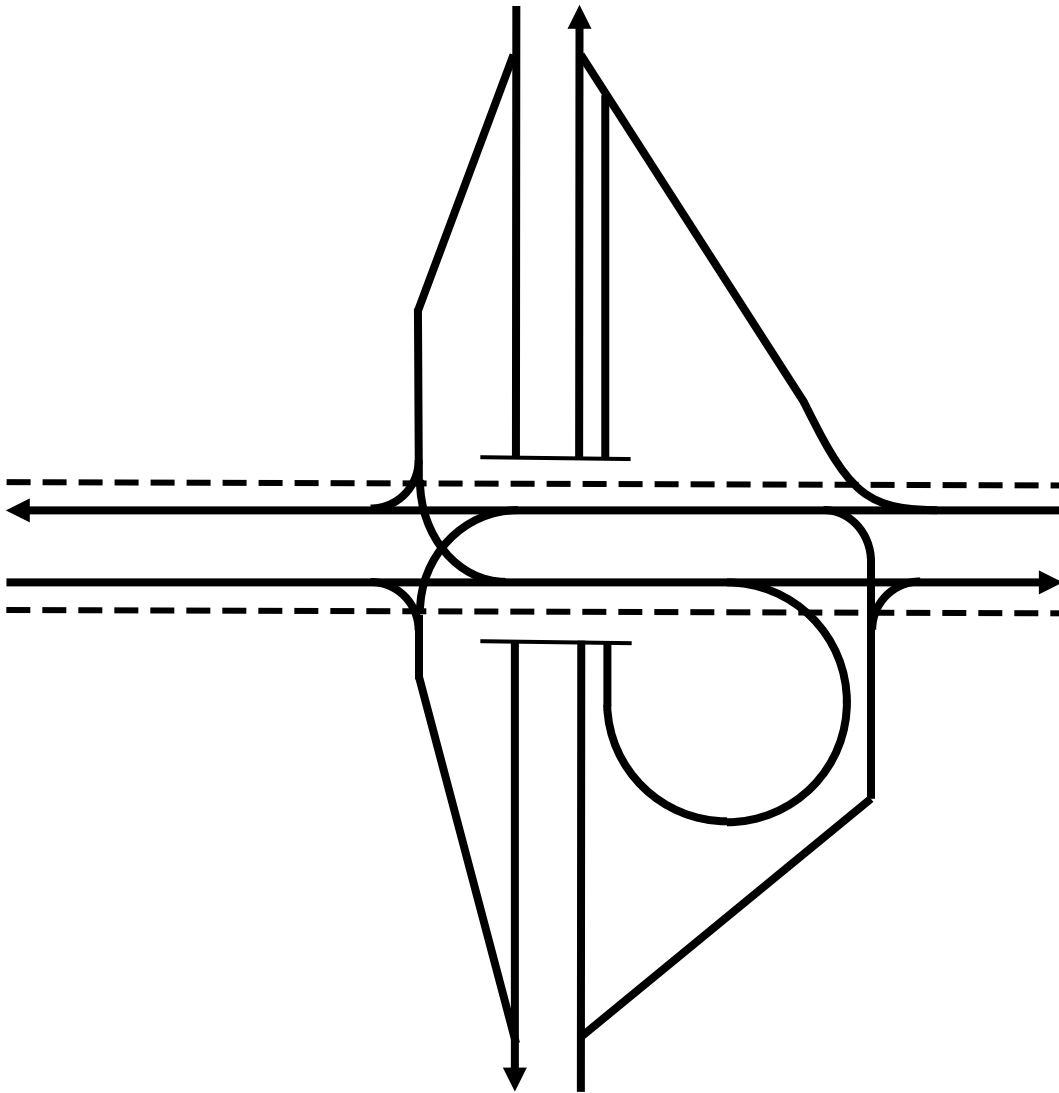
## biBD, One Loop A

**Summary:** Provides good safety benefits but has poor efficiency. More specifically, this design has poor capacity and progression.

**History:** This is a relatively rare design.

**Rank:** 90 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 1           | 2                 | 2               | 4                 | 4                   | 3                  | 4           | 3                 | 3                    | 1                     | 4                  | 13             | 11           | 28            |



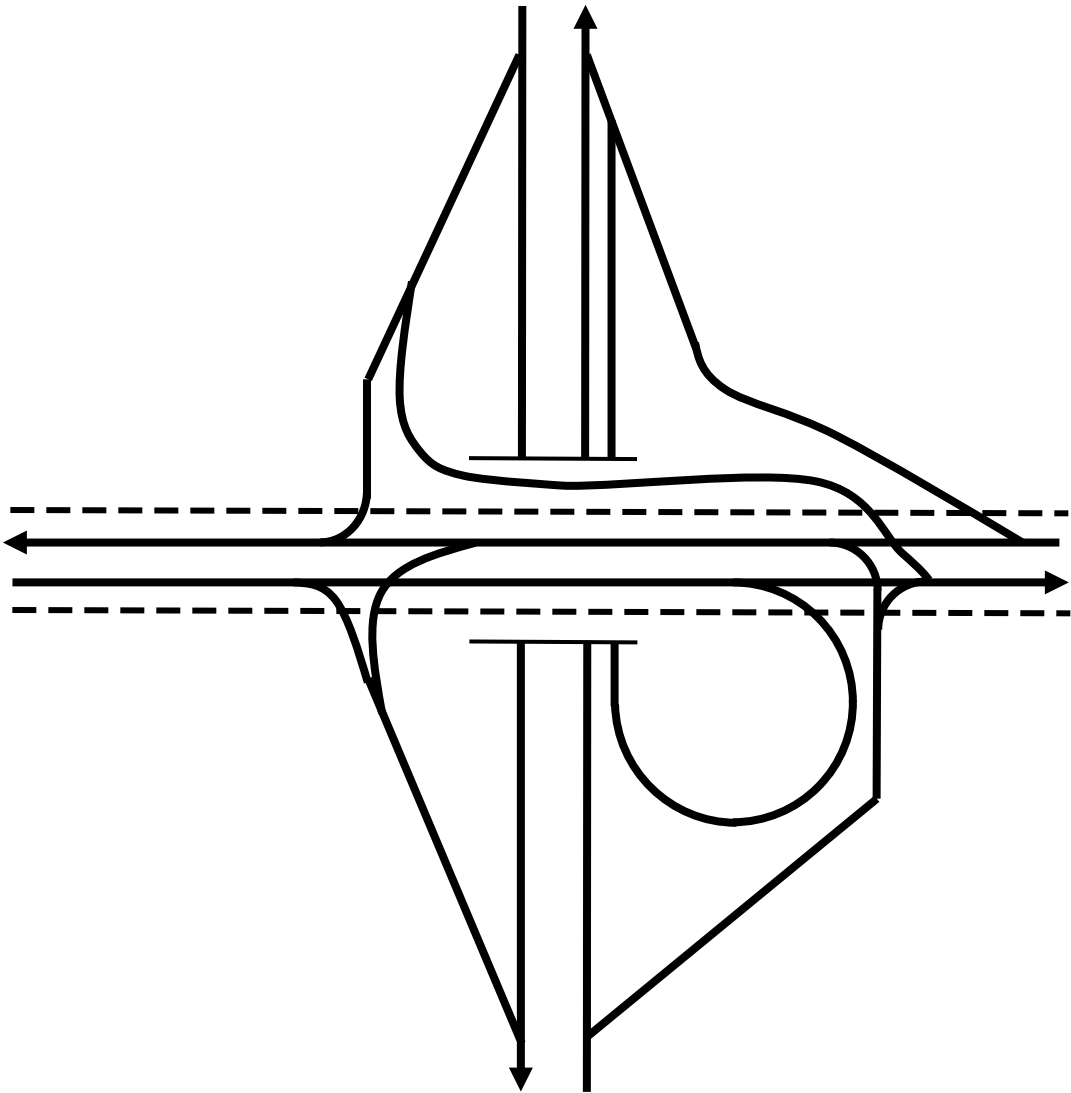
# biDH, Parclo One Loop A with Displaced Left from Freeway

**Summary:** Provides poor cost scores. Has a low wrong way potential but poor capacity and requires a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 97 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 3                 | 3               | 3                 | 4                   | 2                  | 3           | 2                 | 2                    | 1                     | 7                  | 12             | 8            | 27            |



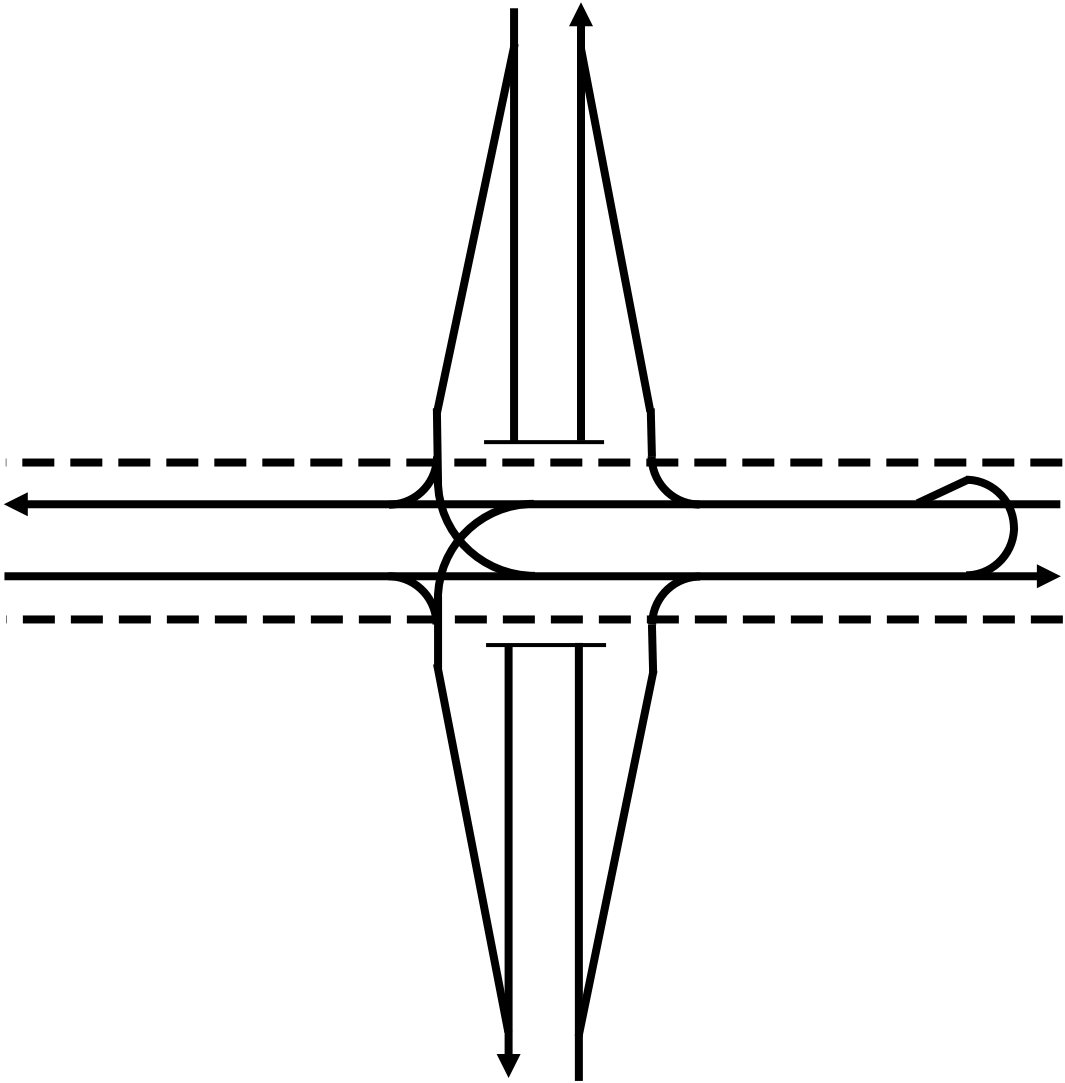
### bjBJ, One Downstream U-Turn

**Summary:** Meets ideal cost criteria and has good safety performance. The only major downside to this design is its poor capacity. This could compete with a tight diamond where there is room for the u-turn crossover.

**History:** This is a new design.

**Rank:** 4 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 3                 | 3               | 4                 | 3                   | 3                  | 5           | 5                 | 5                    | 5                     | 7                  | 13             | 20           | 40            |



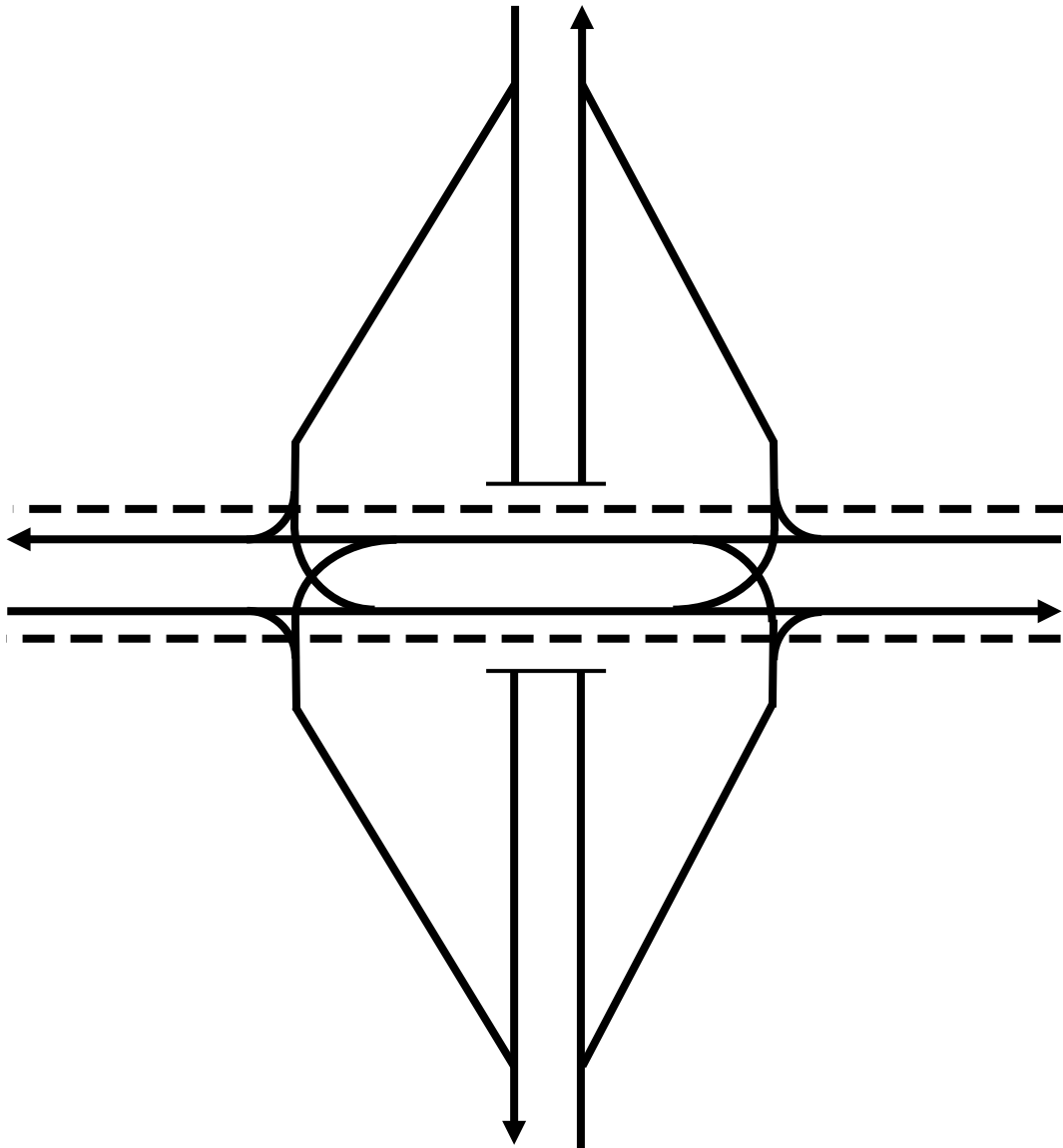
## ccCC, Standard Diamond

**Summary:** Supplies good safety and cost performance but has poor efficiency. More specifically, this design has poor progression and capacity.

**History:** First constructed in the US in 1941, it has since become the most common interchange design. Extremely common design at rural interchanges.

**Rank:** 36 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 0           | 4                 | 1               | 5                 | 4                   | 4                  | 4           | 4                 | 4                    | 3                     | 5                  | 14             | 15           | 34            |





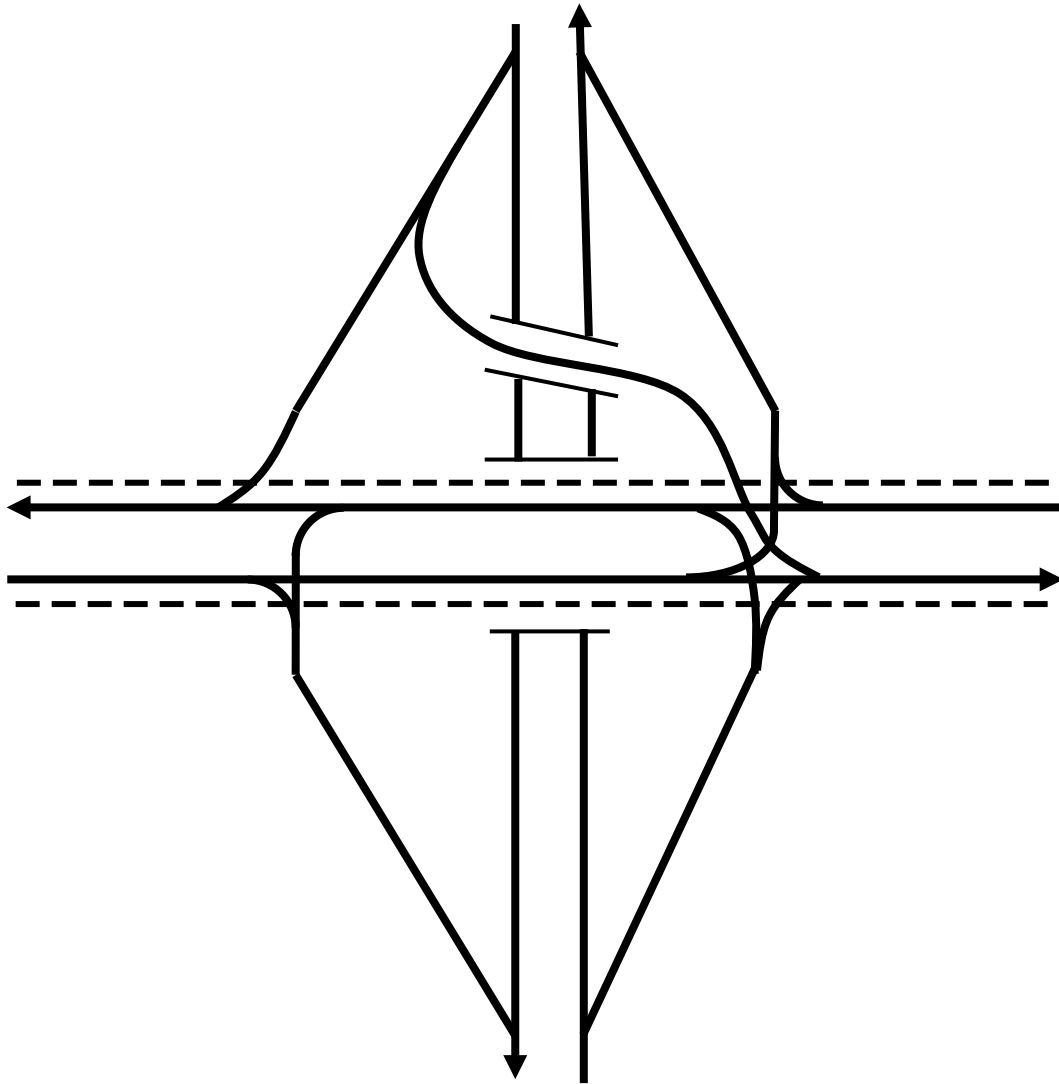
## ccCH, Standard Diamond One Displaced Left from Freeway

**Summary:** Supplies good cost scores with a small right of way. Has poor capacity and a high number of conflict points.

**History:** This is a new design.

**Rank:** 42 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 4                 | 1               | 4                 | 3                   | 4                  | 3           | 4                 | 3                    | 3                     | 8                  | 12             | 13           | 33            |



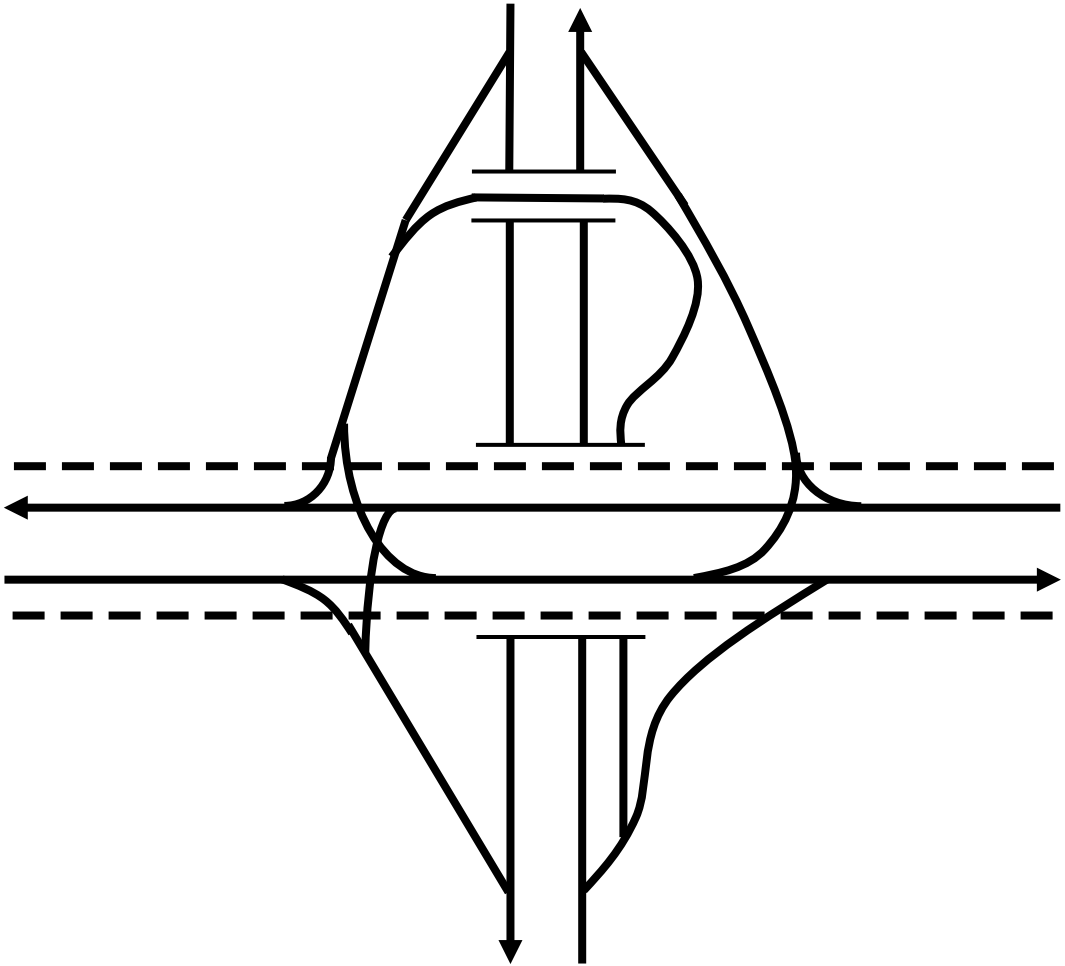
ccCI, Standard Diamond One Milwaukee B

**Summary:** Supplies good safety performance but has poor capacity and requires a large bridge.

**History:** This is a new design.

**Rank:** 74 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 3                 | 2               | 4                 | 3                   | 4                  | 2           | 3                 | 2                    | 3                     | 7                  | 13             | 10           | 30            |



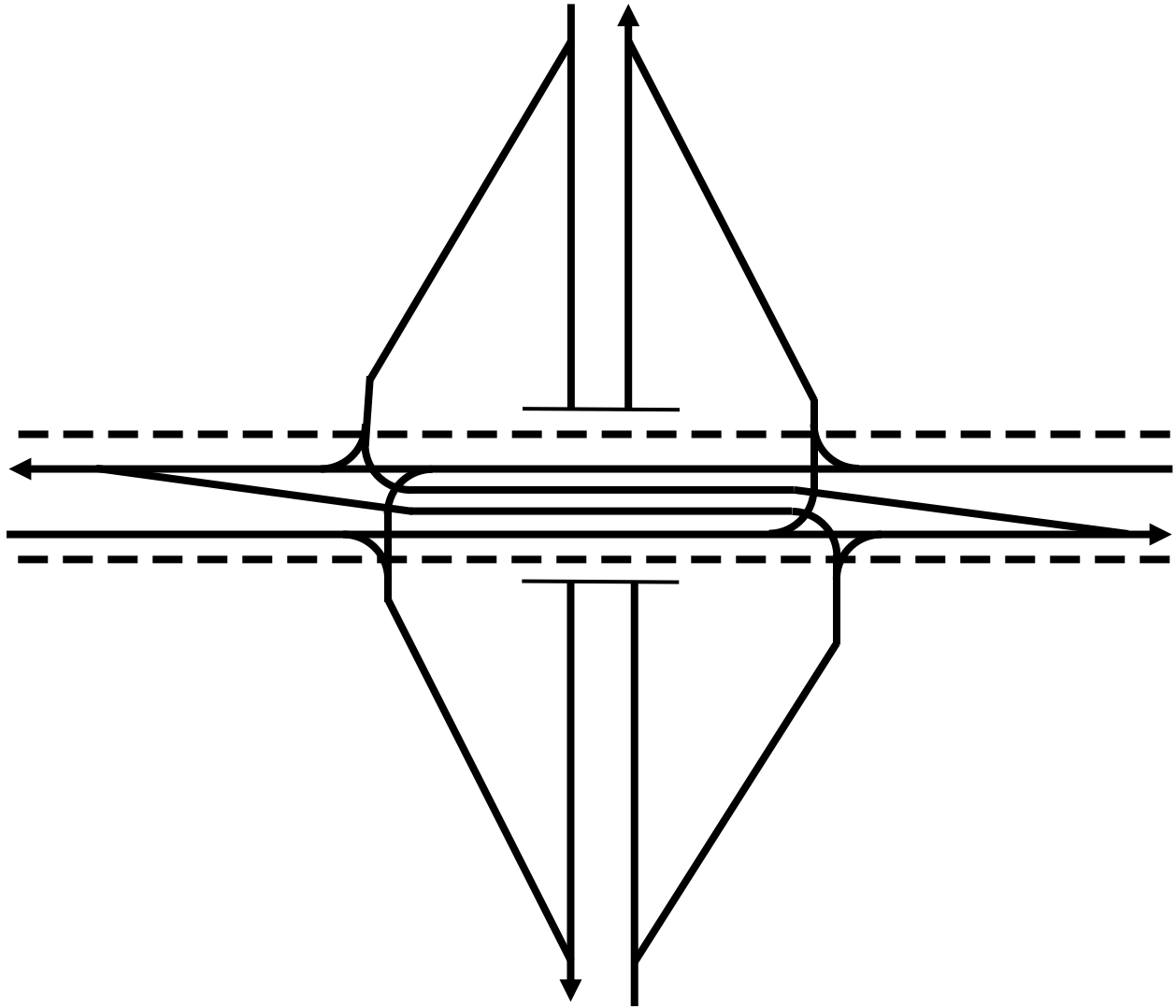
## ccFF, Standard Diamond Standard Contraflow

**Summary:** Provides average efficiency, safety, and cost performance but has poor progression, has a large number of conflict points, and requires a large bridge.

**History:** This is a new design.

**Rank:** 59 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 1           | 4                 | 0               | 4                 | 4                   | 4                  | 1           | 4                 | 4                    | 2                     | 9                  | 12             | 11           | 32            |



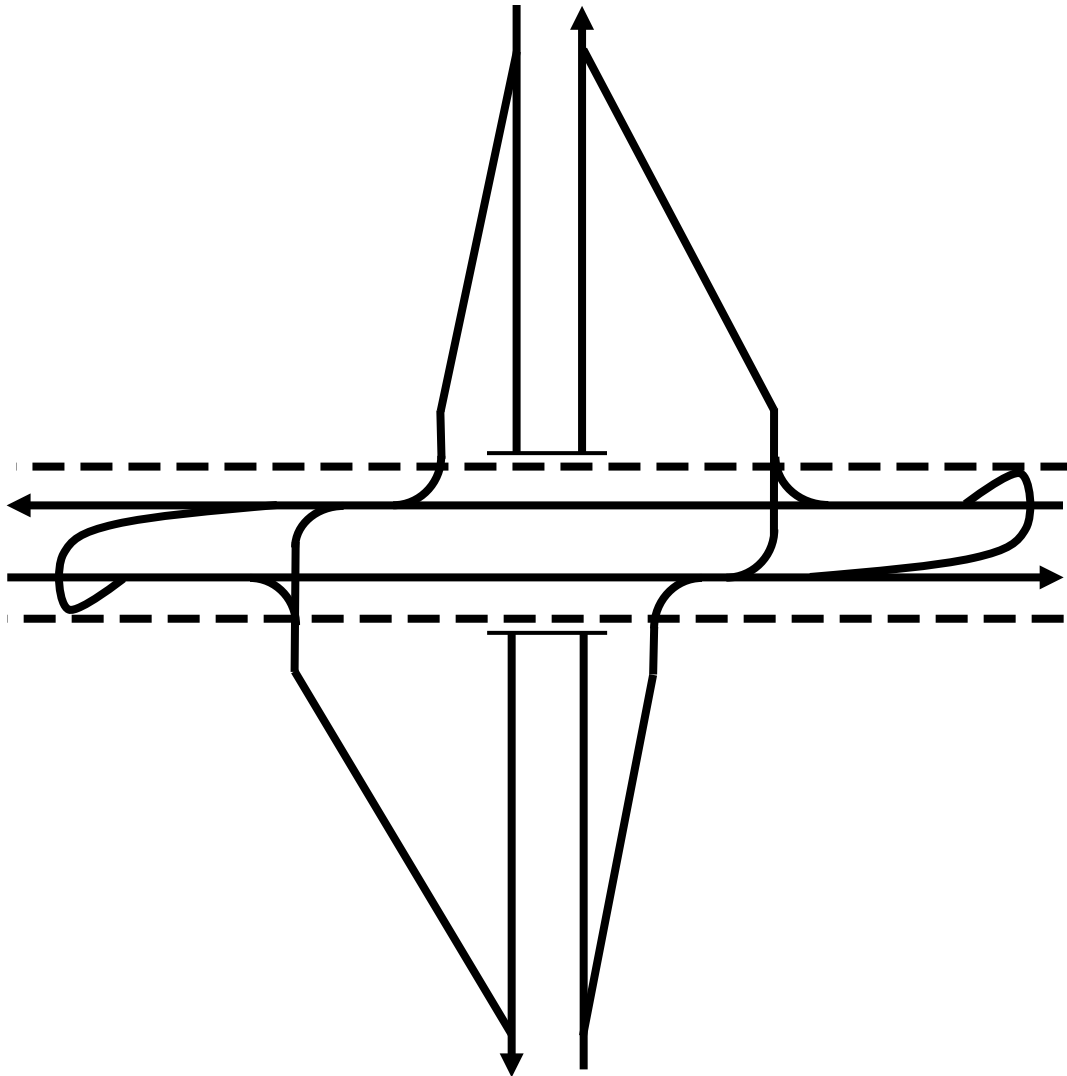
## ccJJ, Superstreet

**Summary:** Supplies good safety and cost scores but has poor capacity and lengthy travel distances. The Synchronized concept (eeJJ) is likely a more competitive design in the same space.

**History:** First published by Hummer, 2014.

**Rank:** 8 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 5           | 2                 | 3               | 4                 | 4                   | 4                  | 4           | 4                 | 4                    | 3                     | 9                  | 15             | 15           | 39            |



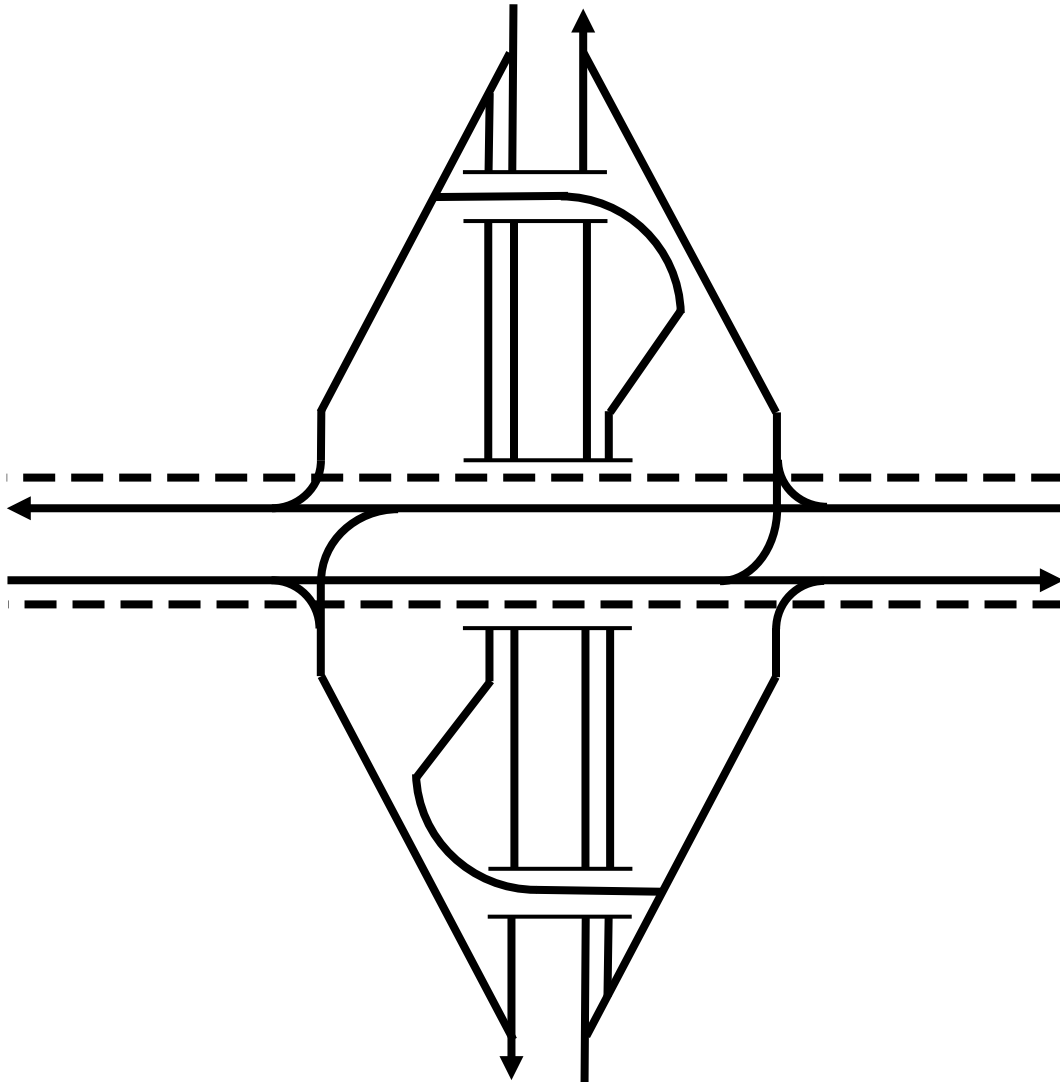
## ccLL, Standard Diamond U-Turn Over Freeway with Slip Ramp

**Summary:** Provides good efficiency and safety performance but has poor cost scores. Requires a large bridge and extensive right of way.

**History:** This is a new design.

**Rank:** 67 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 2                 | 3               | 5                 | 4                   | 4                  | 0           | 0                 | 1                    | 3                     | 11                 | 16             | 4            | 31            |



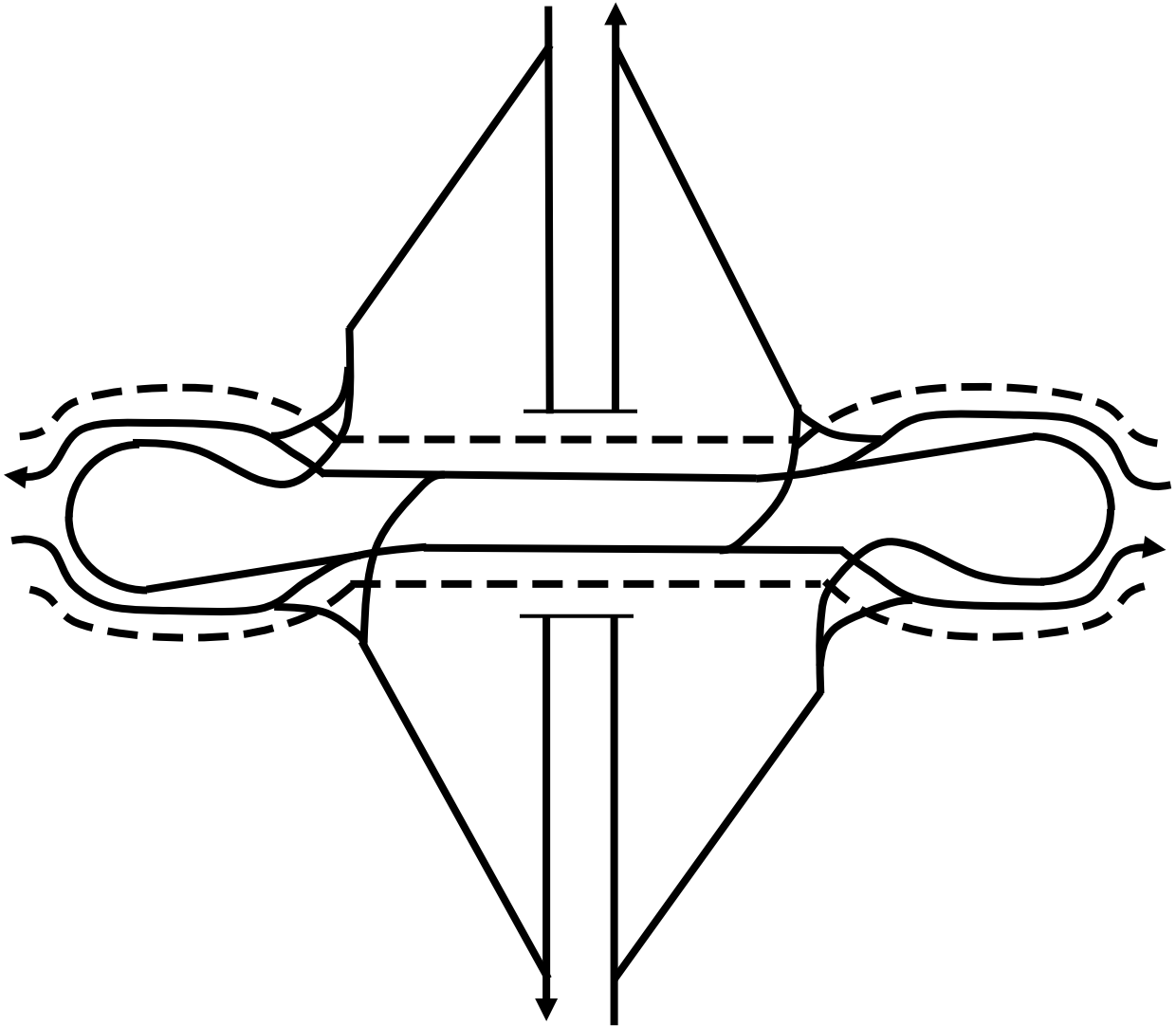
## ccMM, Standard Diamond St. Augustine

**Summary:** Supplies good safety benefits but has poor capacity and requires a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 59 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 5           | 2                 | 2               | 3                 | 4                   | 4                  | 4           | 3                 | 4                    | 0                     | 8                  | 13             | 11           | 32            |



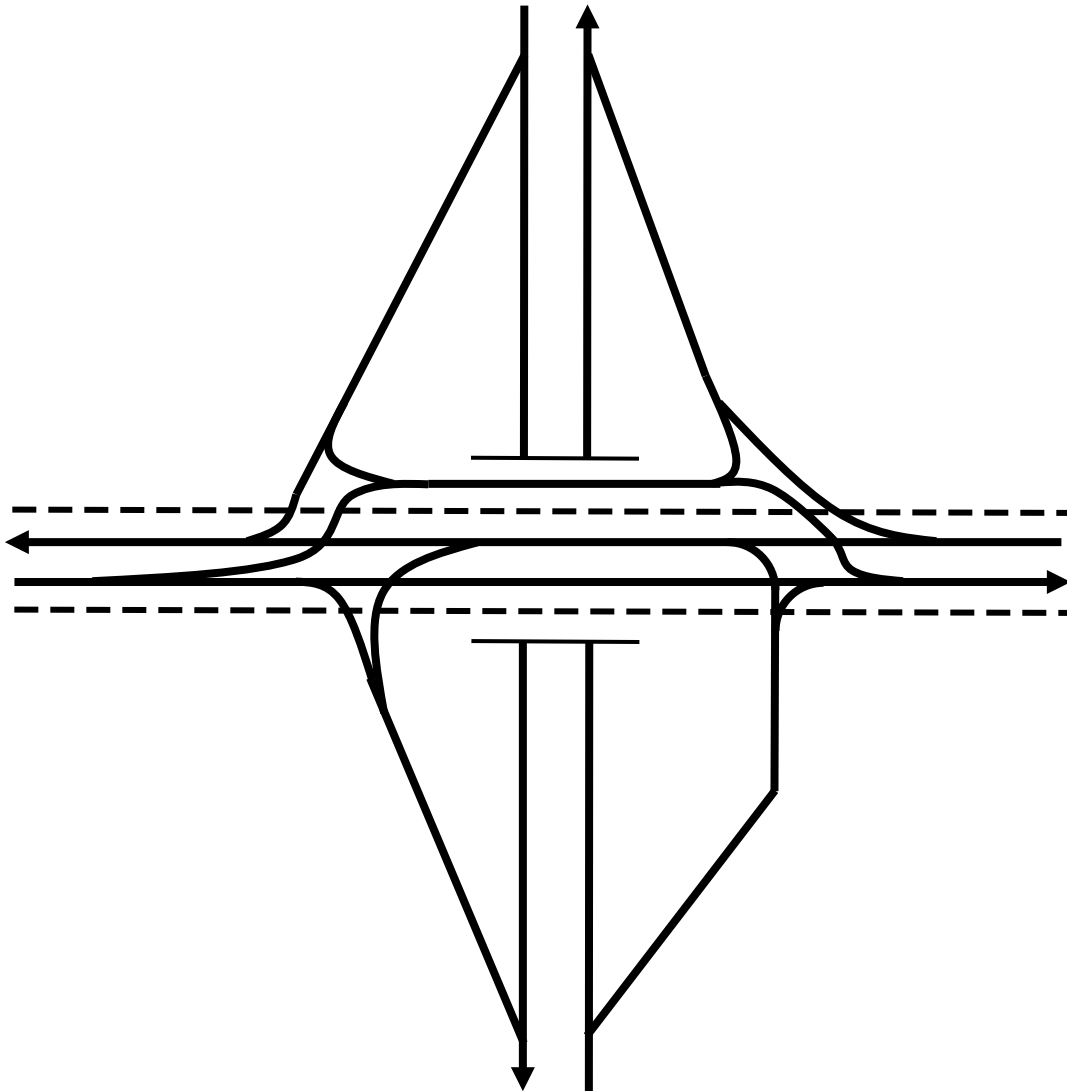
## chCH, One-Sided DDI

**Summary:** Supplies good efficiency and safety benefits. Has a high number of conflict points and a large bridge. Could be a competitive retrofit for an over-capacity diamond.

**History:** One has opened at I-35 and MO-152 north of Kansas City, MO. First published by Yu and Wang, 2022.

**Rank:** 17 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 4                 | 2               | 4                 | 3                   | 4                  | 2           | 4                 | 4                    | 2                     | 12                 | 13             | 12           | 37            |



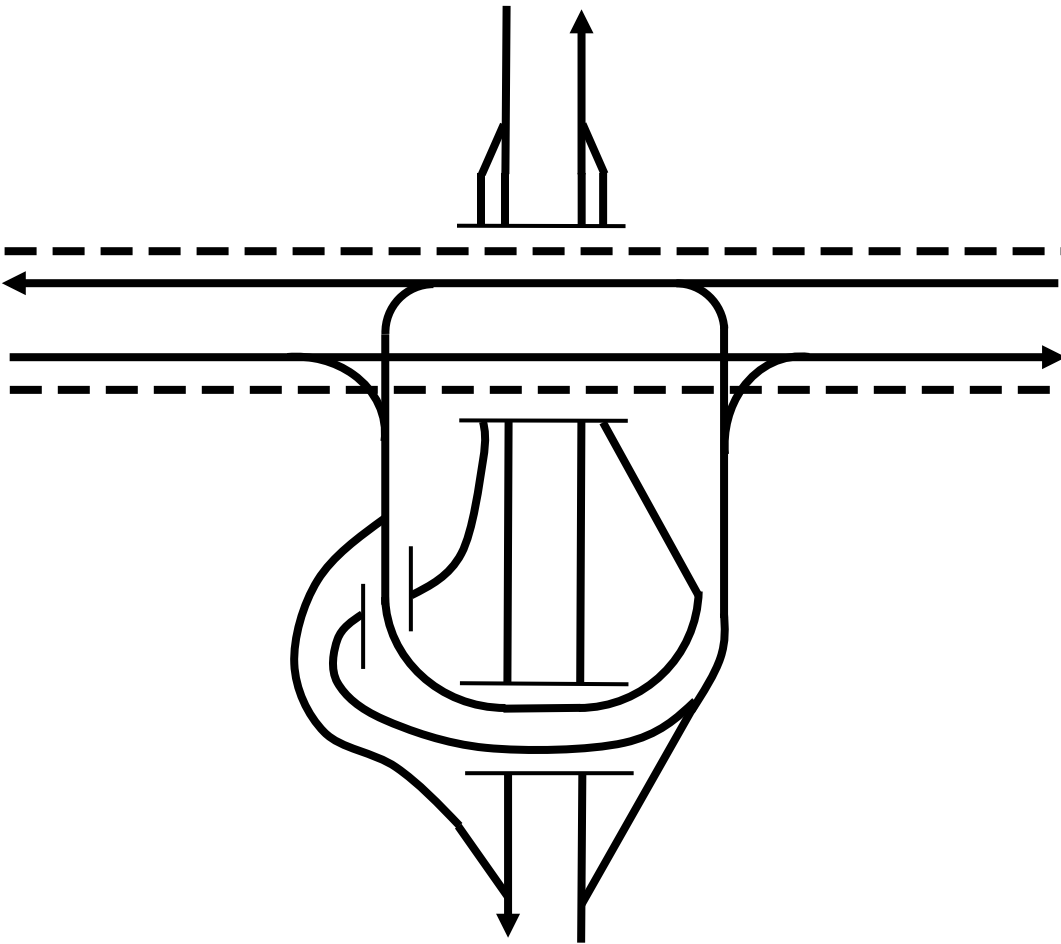
clCL, Elevated Double U

**Summary:** Provides good safety performance but has poor efficiency and cost scores. More specifically, this design requires a large bridge and extensive travel distances.

**History:** This is a new design.

**Rank:** 89 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 4           | 0                 | 4               | 2                 | 3                   | 5                  | 0           | 2                 | 3                    | 3                     | 6                  | 14             | 8            | 28            |





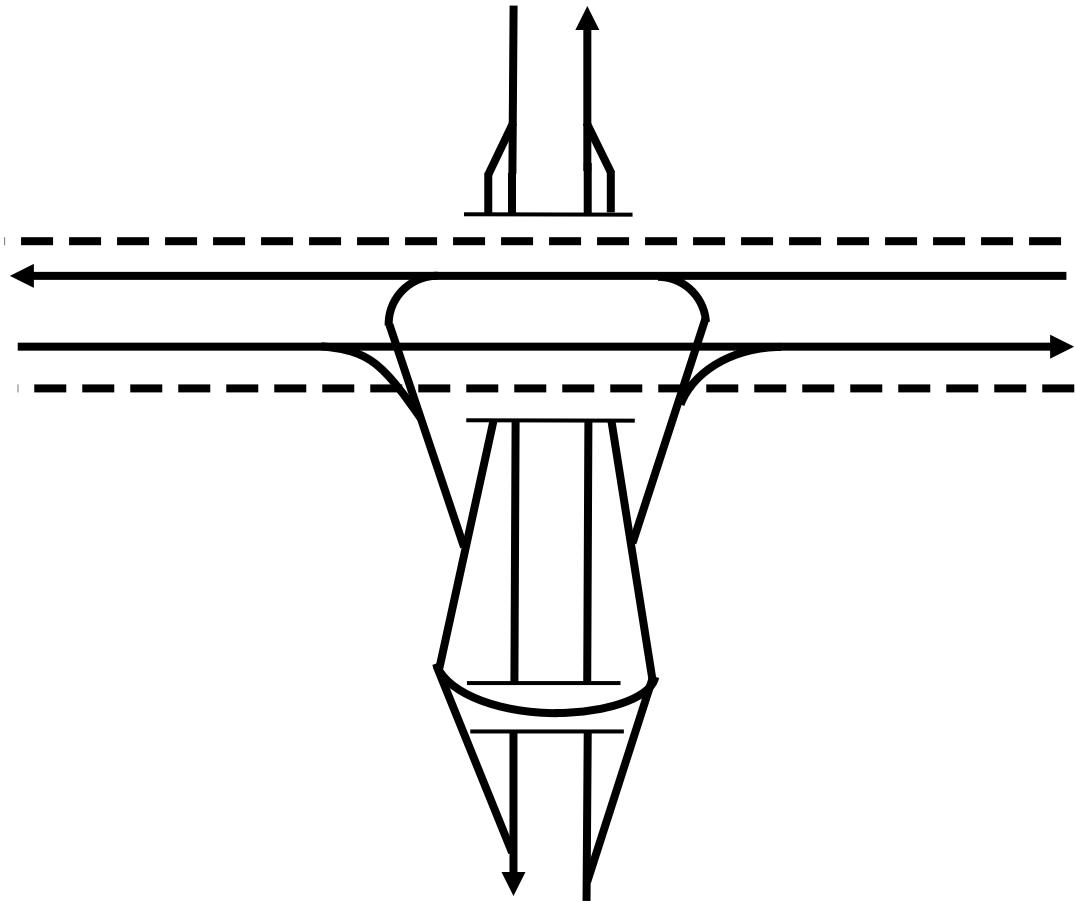
cICL, V

**Summary:** Supplies average safety and cost performance but scores poorly in efficiency. Requires extensive travel distances and has a high number of unusual maneuvers. This concept could compete with a parclo AB.

**History:** This is a new design.

**Rank:** 76 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 4           | 0                 | 4               | 0                 | 3                   | 5                  | 3           | 3                 | 3                    | 3                     | 6                  | 12             | 12           | 30            |



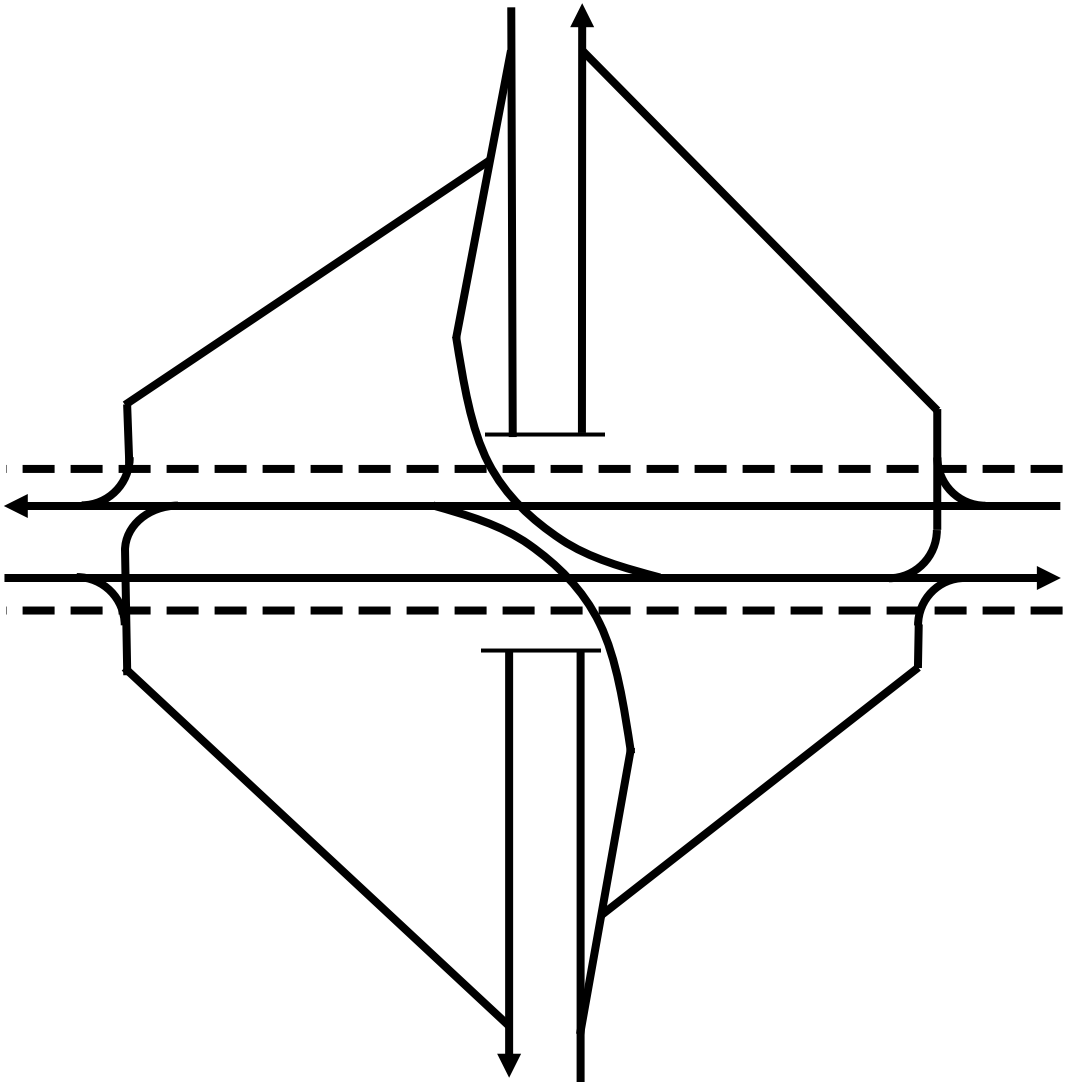
ddAA, Three Point

**Summary:** Supplies good efficiency but poor cost performance. Has high wrong way potential and requires a lengthy extent along the arterial.

**History:** One is open at I-55 and MO-141 in Arnold, Missouri.

**Rank:** 88 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 4                 | 2               | 4                 | 1                   | 3                  | 3           | 2                 | 2                    | 0                     | 12                 | 10             | 7            | 29            |



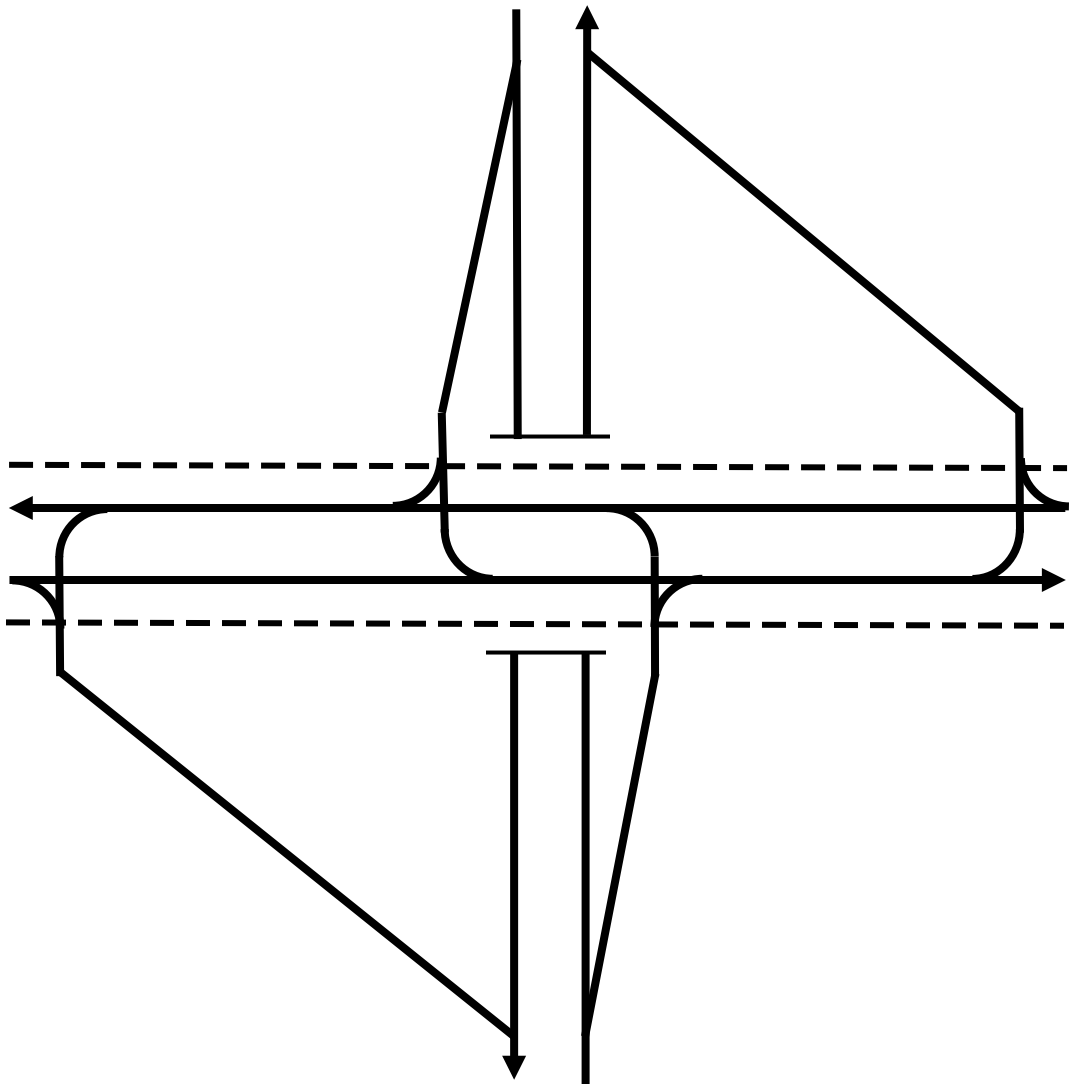
ddBB, Spread Diamond Tight Diamond

**Summary:** Supplies good safety and cost scores but has poor capacity. Requires a small bridge and has a low number of unusual maneuvers.

**History:** This is a new design.

**Rank:** 22 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 4                 | 2               | 5                 | 3                   | 4                  | 5           | 4                 | 3                    | 2                     | 8                  | 14             | 14           | 36            |



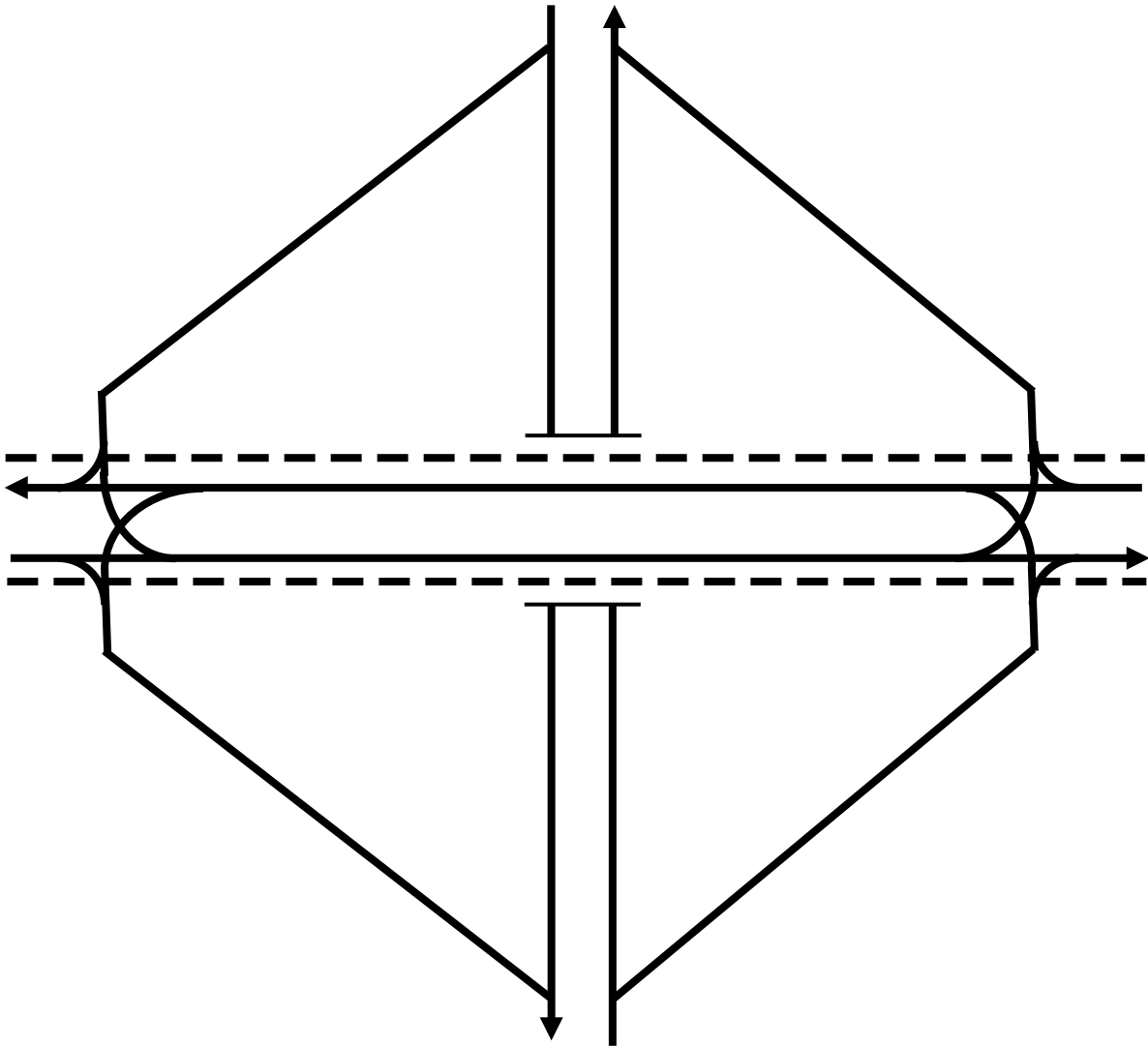
# ddDD, Spread Diamond

**Summary:** Supplies good safety benefits but has poor efficiency. Has poor capacity, poor progression, a large number of conflict points, and a lengthy extent along the arterial.

**History:** This is a fairly common design, particularly in rural settings.

**Rank:** 99 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 0           | 2                 | 1               | 5                 | 4                   | 4                  | 5           | 2                 | 3                    | 0                     | 3                  | 14             | 10           | 27            |



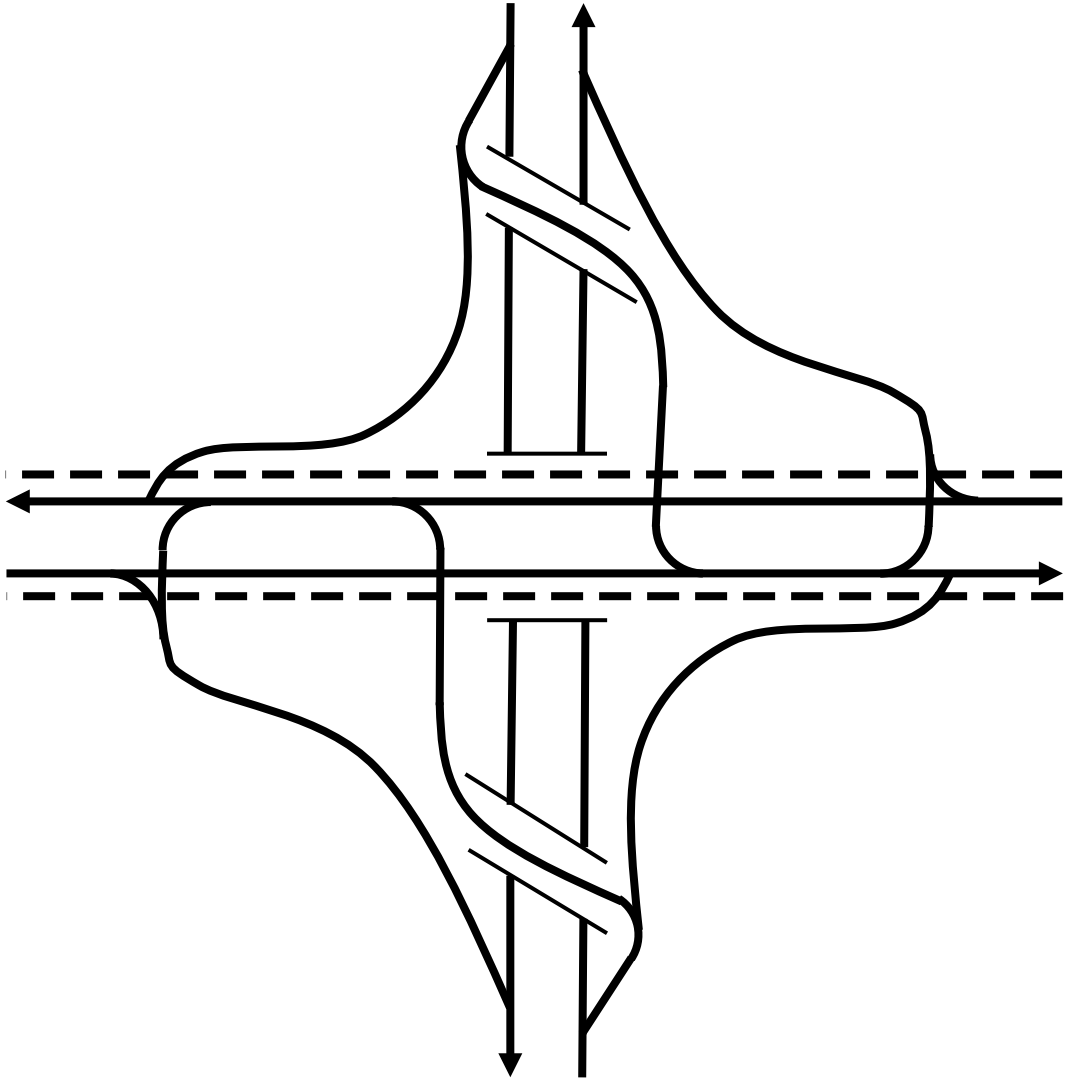
ddHH, Spread Diamond Displaced

**Summary:** Supplies good efficiency and safety with a small bridge and a low number of unusual maneuvers.

**History:** This is a new design.

**Rank:** 38 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 4                 | 2               | 5                 | 2                   | 3                  | 4           | 2                 | 2                    | 2                     | 12                 | 12             | 10           | 34            |



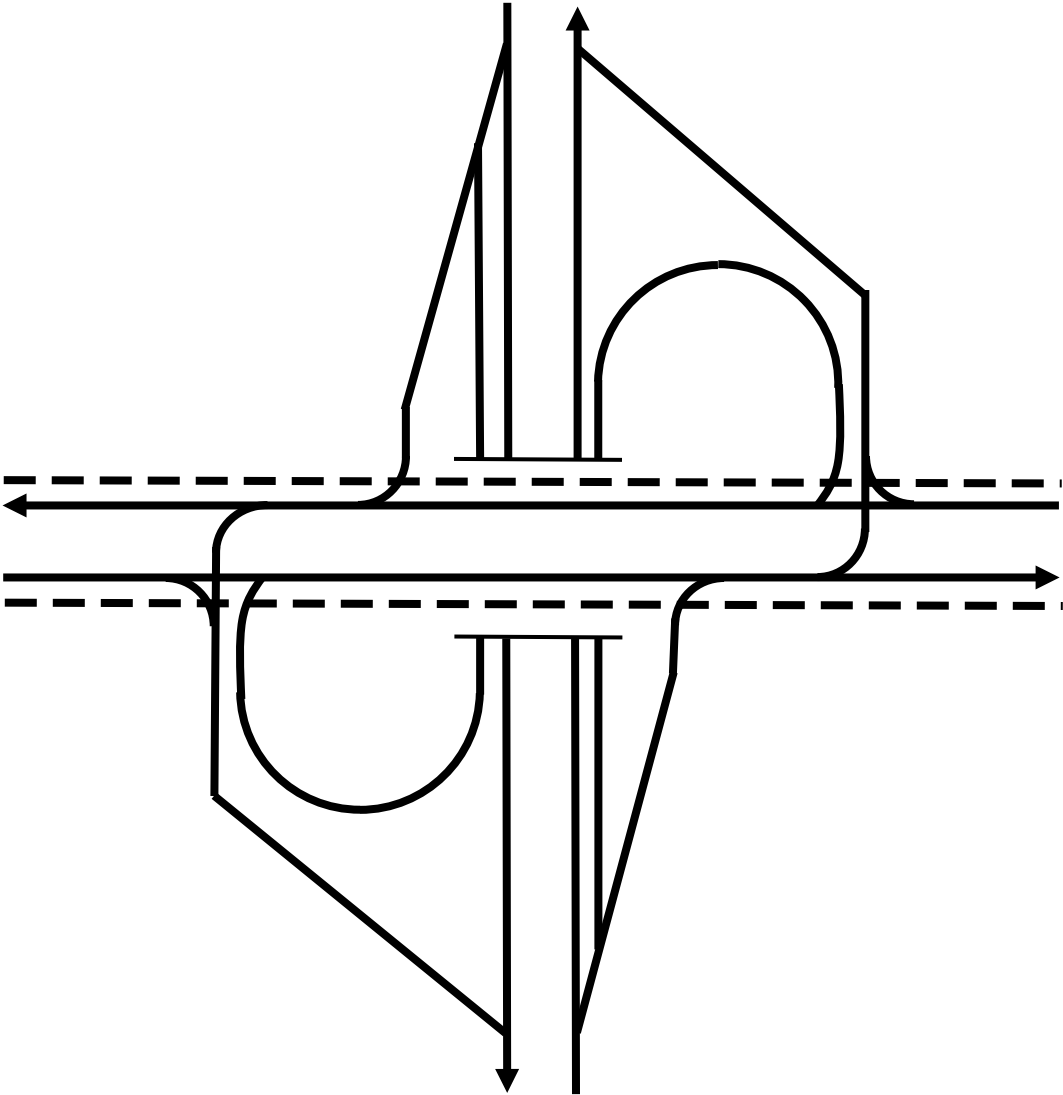
ddII, Parco B

**Summary:** Supplies good efficiency and safety. Has great progression, a low number of unusual maneuvers, and a small bridge size but longer travel distances.

**History:** This is a common design often used in high demand suburban areas.

**Rank:** 21 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 1                 | 3               | 5                 | 4                   | 3                  | 5           | 2                 | 2                    | 2                     | 10                 | 15             | 11           | 36            |



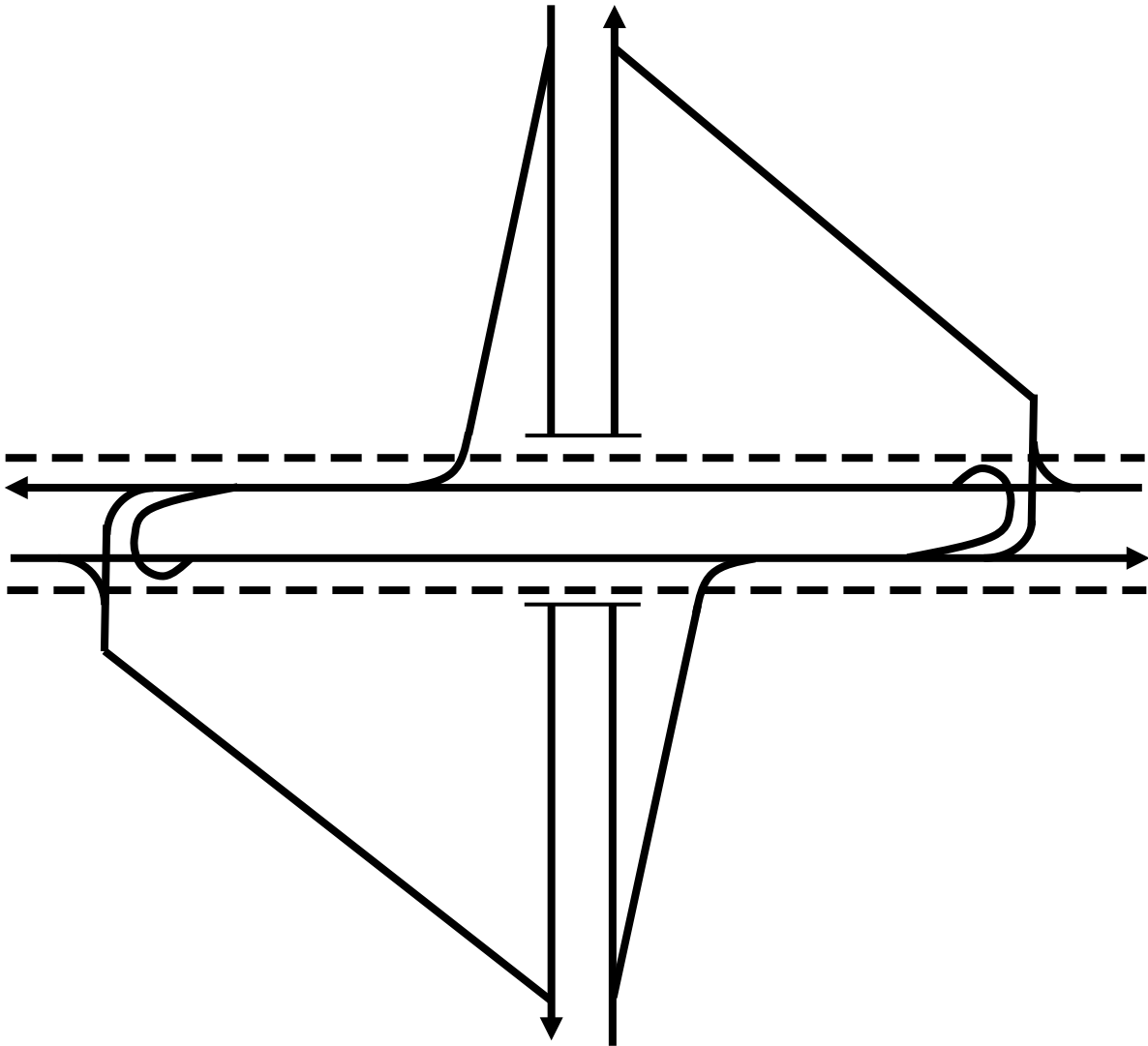
# ddJJ, Spread Diamond U-Turn on Arterial

**Summary:** Supplies good safety and cost scores. Requires extensive travel distances and lengthy extents along the arterial. Has the advantages of a concept with u-turn crossovers without extra right of way for the crossovers.

**History:** This is a new design.

**Rank:** 20 of 108.

|          |             |                   |                 |                   |                     |                    |             |                   |                      |                       |                    |                |              |               |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
| 2        | 5           | 1                 | 3               | 4                 | 4                   | 4                  | 5           | 4                 | 3                    | 1                     | 8                  | 15             | 13           | 36            |



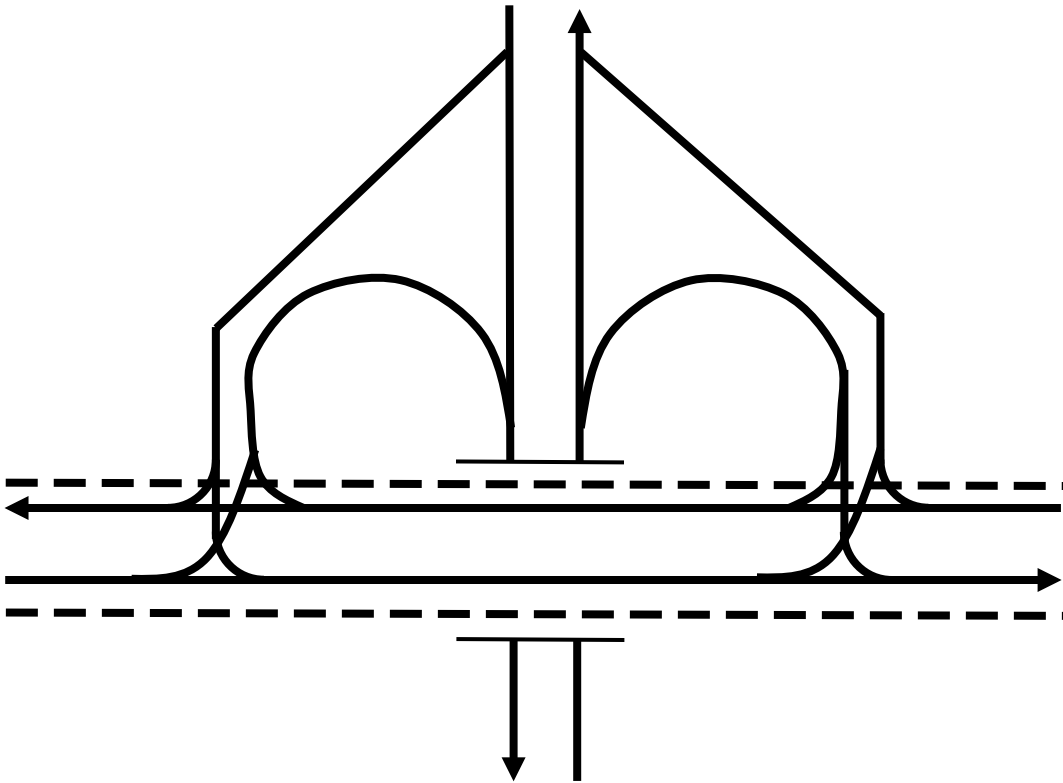
diDI, Parclo AB

**Summary:** Supplies good cost scores but has poor efficiency. Has poor capacity, poor progression, lengthy travel distances, and a high number of conflict points.

**History:** This is a common design often used where right of way is constrained on one side of the arterial.

**Rank:** 93 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 1           | 0                 | 1               | 3                 | 3                   | 5                  | 4           | 2                 | 5                    | 3                     | 2                  | 12             | 14           | 28            |





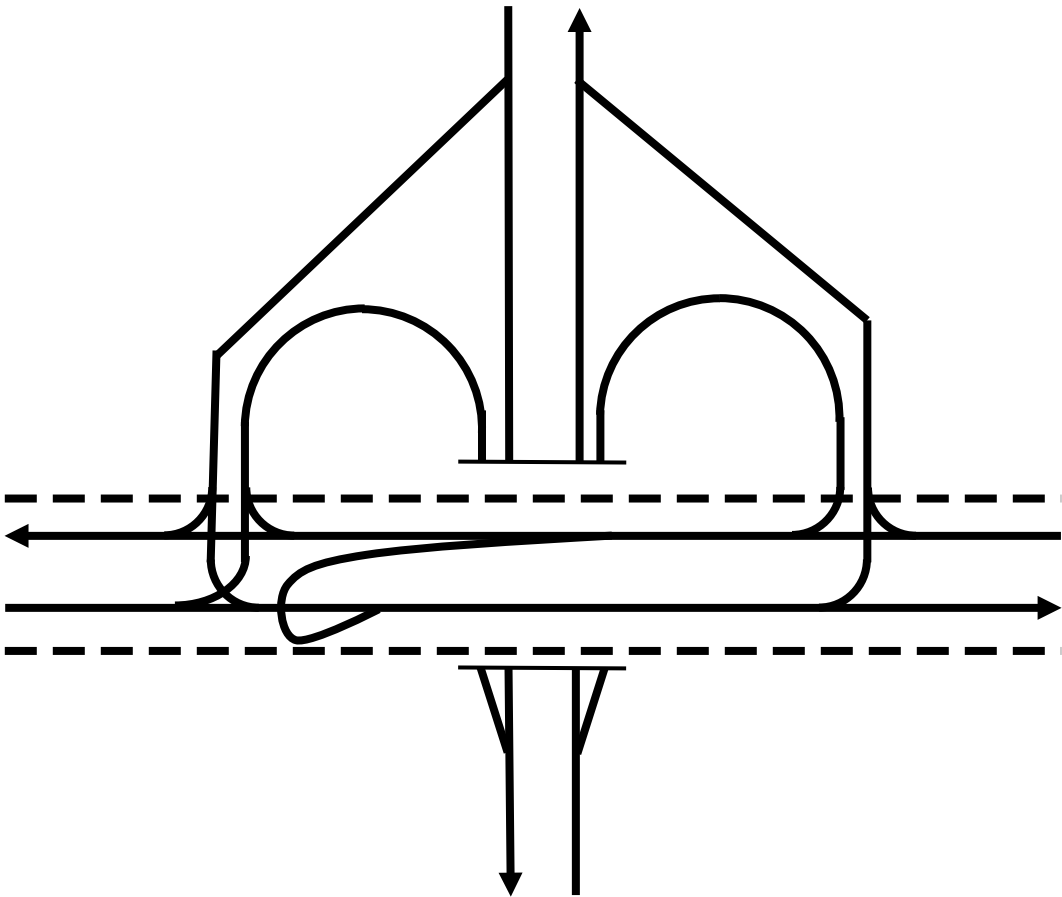
### diDI, Parco AB Internal U-Turn

**Summary:** Supplies good cost scores but has poor efficiency. Has poor capacity and lengthy travel distances. This concept improves progression compared to a parclo AB but has a larger bridge.

**History:** This is a new design.

**Rank:** 91 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 0                 | 2               | 3                 | 2                   | 5                  | 3           | 2                 | 5                    | 2                     | 4                  | 12             | 12           | 28            |



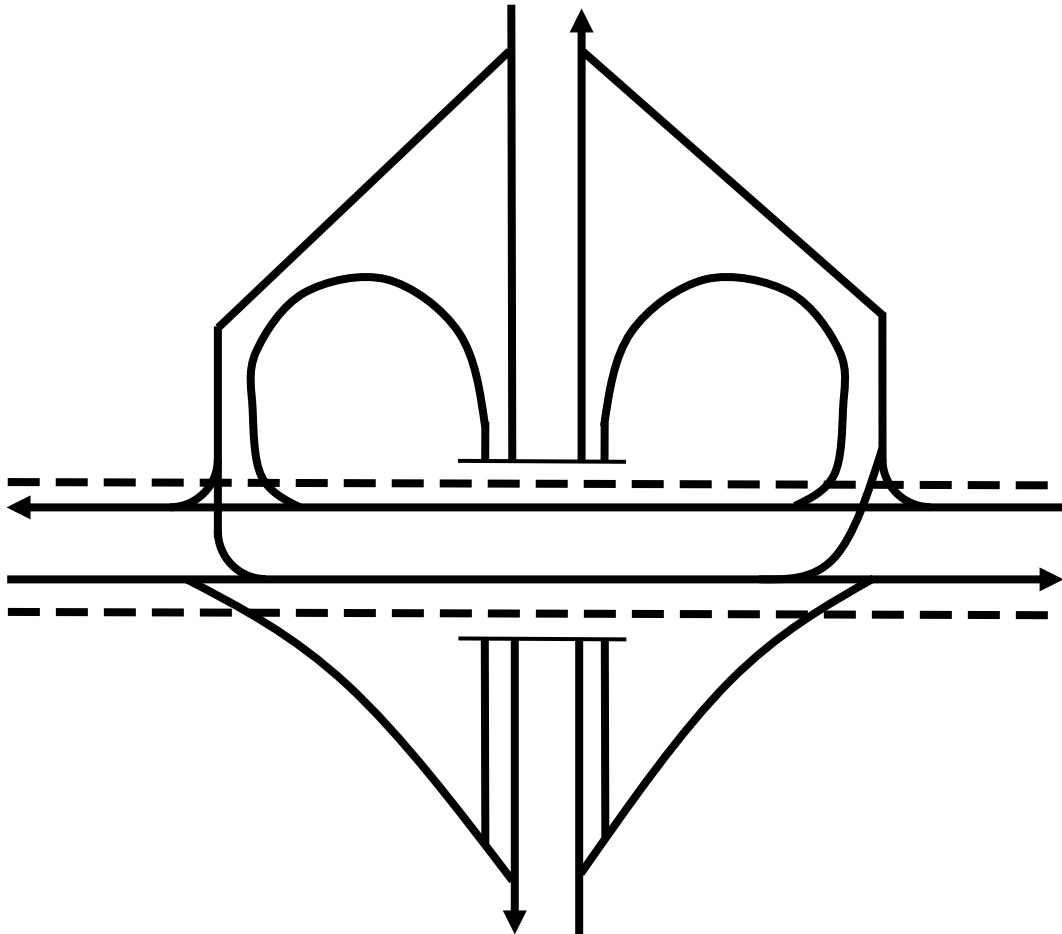
## diDI, Parclo AB with Two Other Right Turn Ramps

**Summary:** Supplies good safety but requires lengthy travel distances, extensive right of way, and a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 86 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 1                 | 3               | 4                 | 3                   | 3                  | 4           | 1                 | 2                    | 0                     | 9                  | 13             | 7            | 29            |



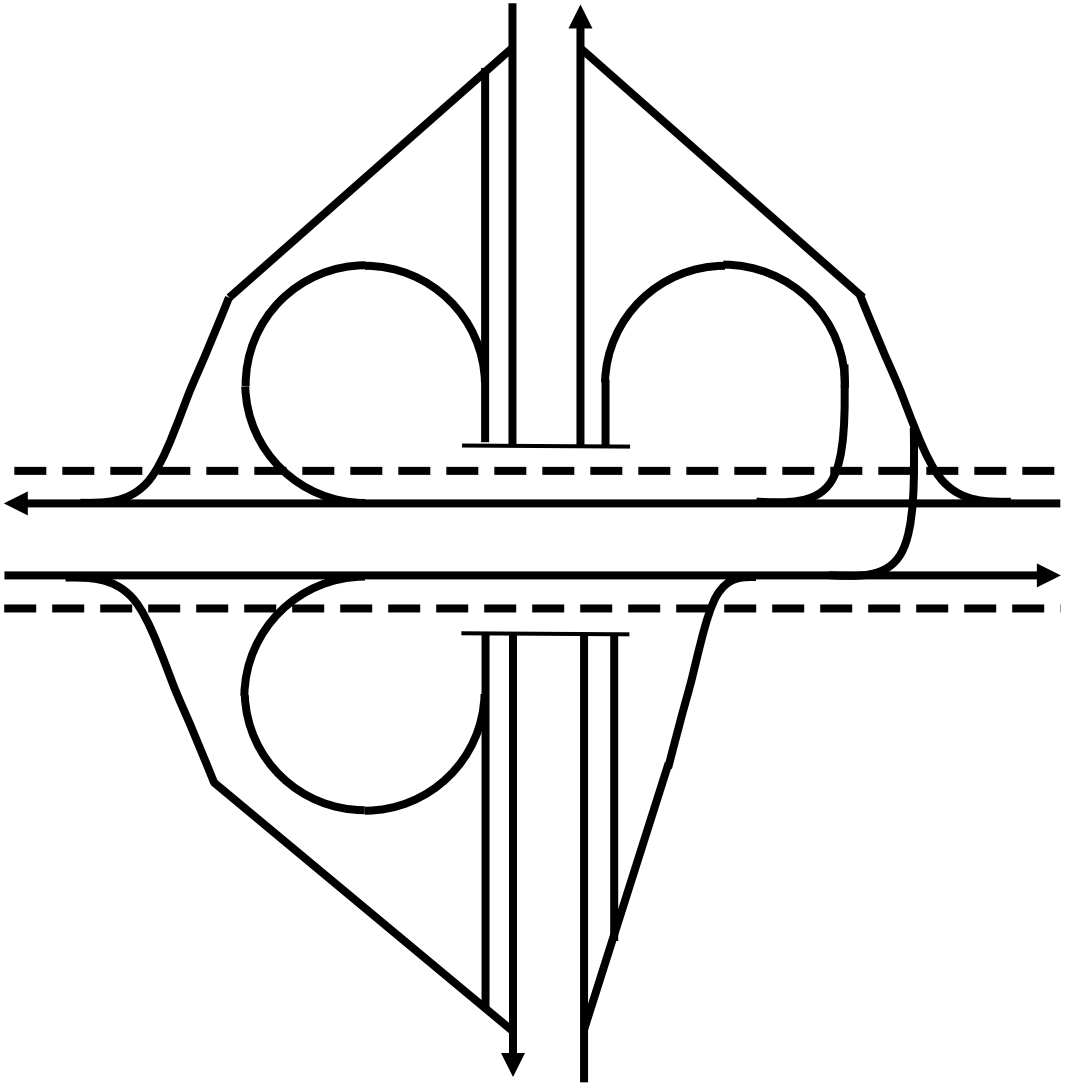
dill, Three Loop Missing A

**Summary:** Supplies average efficiency, safety, and cost scores. Requires lengthy travel distances, a large right of way, and a lengthy extent along the arterial.

**History:** This is a rare design, typically created by removing a cloverleaf loop ramp.

**Rank:** 85 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 0                 | 3               | 3                 | 3                   | 2                  | 5           | 1                 | 2                    | 1                     | 9                  | 11             | 9            | 29            |



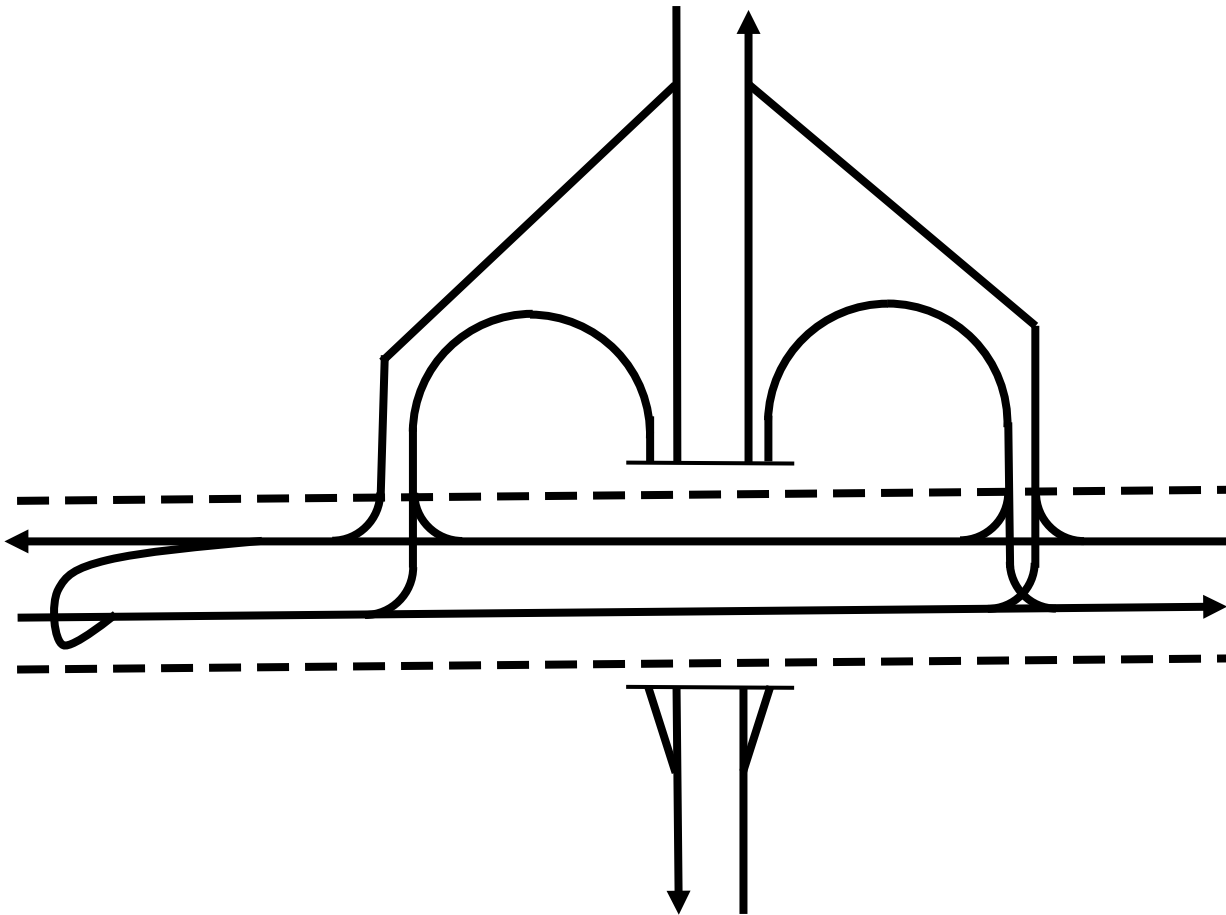
## diIJ, Parco AB with External U-Turn

**Summary:** Supplies good cost scores but has poor capacity and lengthy travel distances.  
This concept improves progression compared to a parco AB with the same size bridge.

**History:** This is a new design.

**Rank:** 83 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 0                 | 2               | 3                 | 2                   | 5                  | 4           | 2                 | 5                    | 2                     | 4                  | 12             | 13           | 29            |



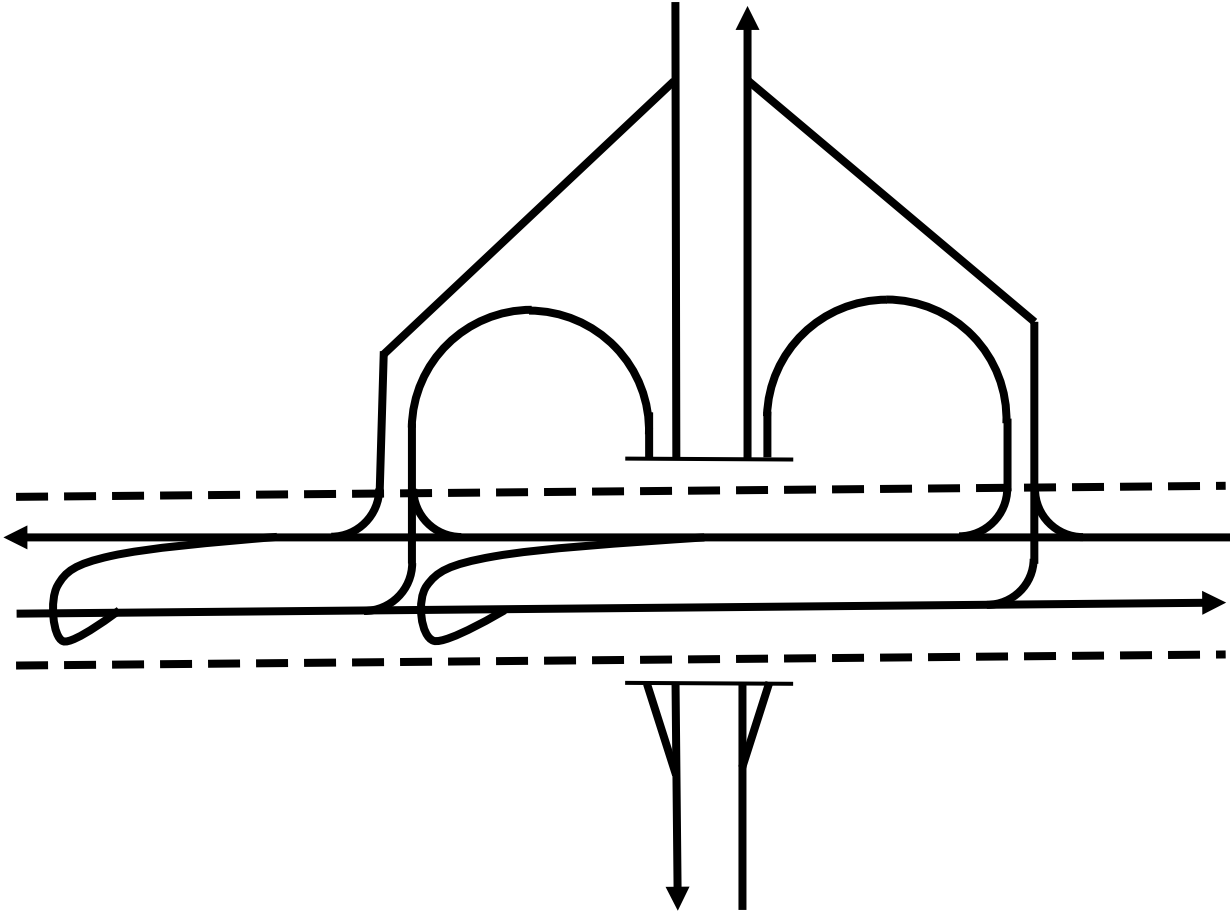
# diIJ, Parco AB with Two U-Turns

**Summary:** Supplies good safety and cost scores but requires long travel distances. This could be a good competitor to a parclo AB.

**History:** This is a new design.

**Rank:** 50 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 5           | 0                 | 3               | 3                 | 3                   | 5                  | 3           | 2                 | 5                    | 2                     | 7                  | 14             | 12           | 33            |



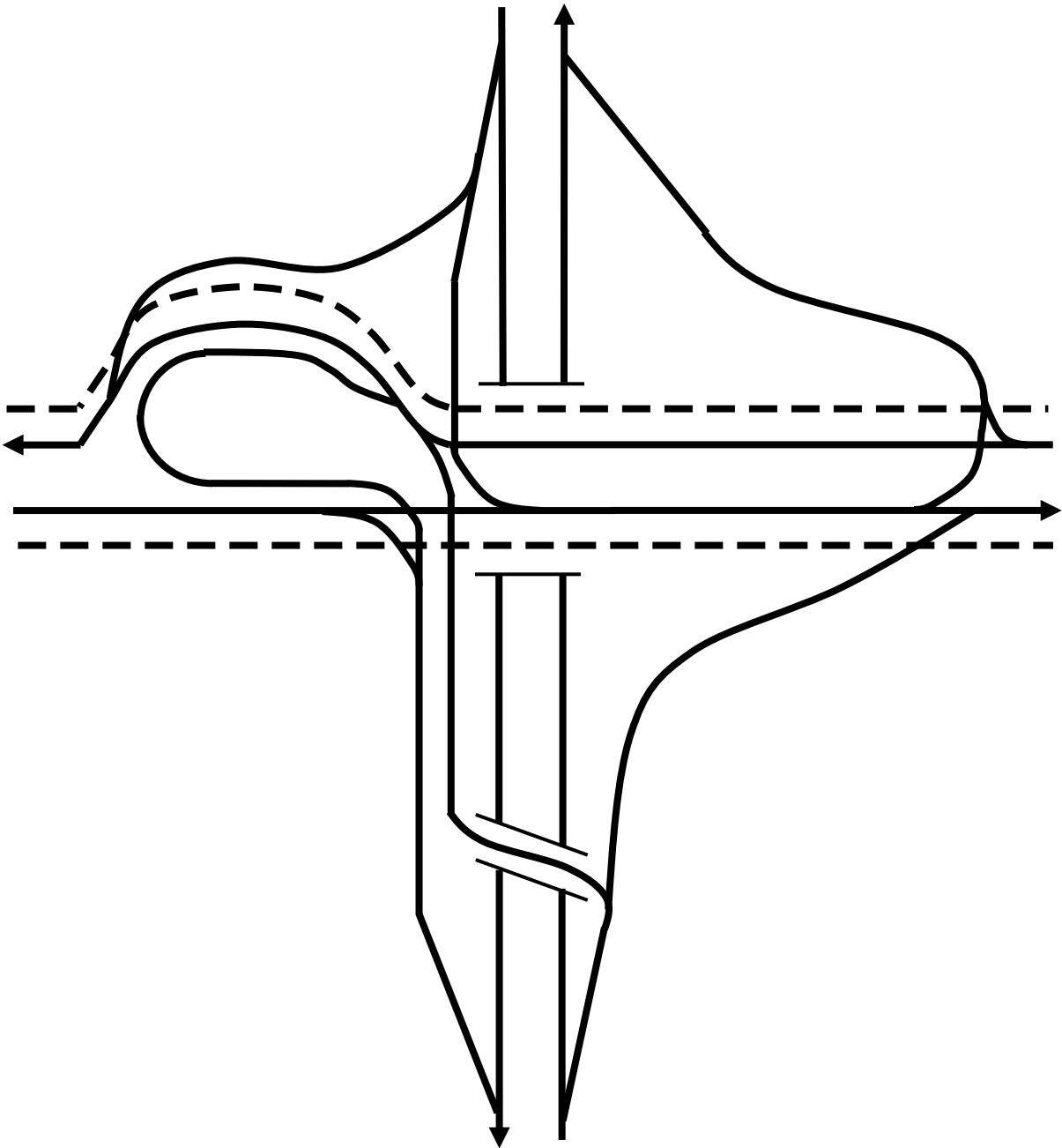
# dmBH, One St. Augustine U-Turn One Displaced

**Summary:** Supplies good efficiency with a small bridge but has a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 48 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 3                 | 2               | 4                 | 2                   | 3                  | 5           | 3                 | 2                    | 1                     | 11                 | 11             | 11           | 33            |



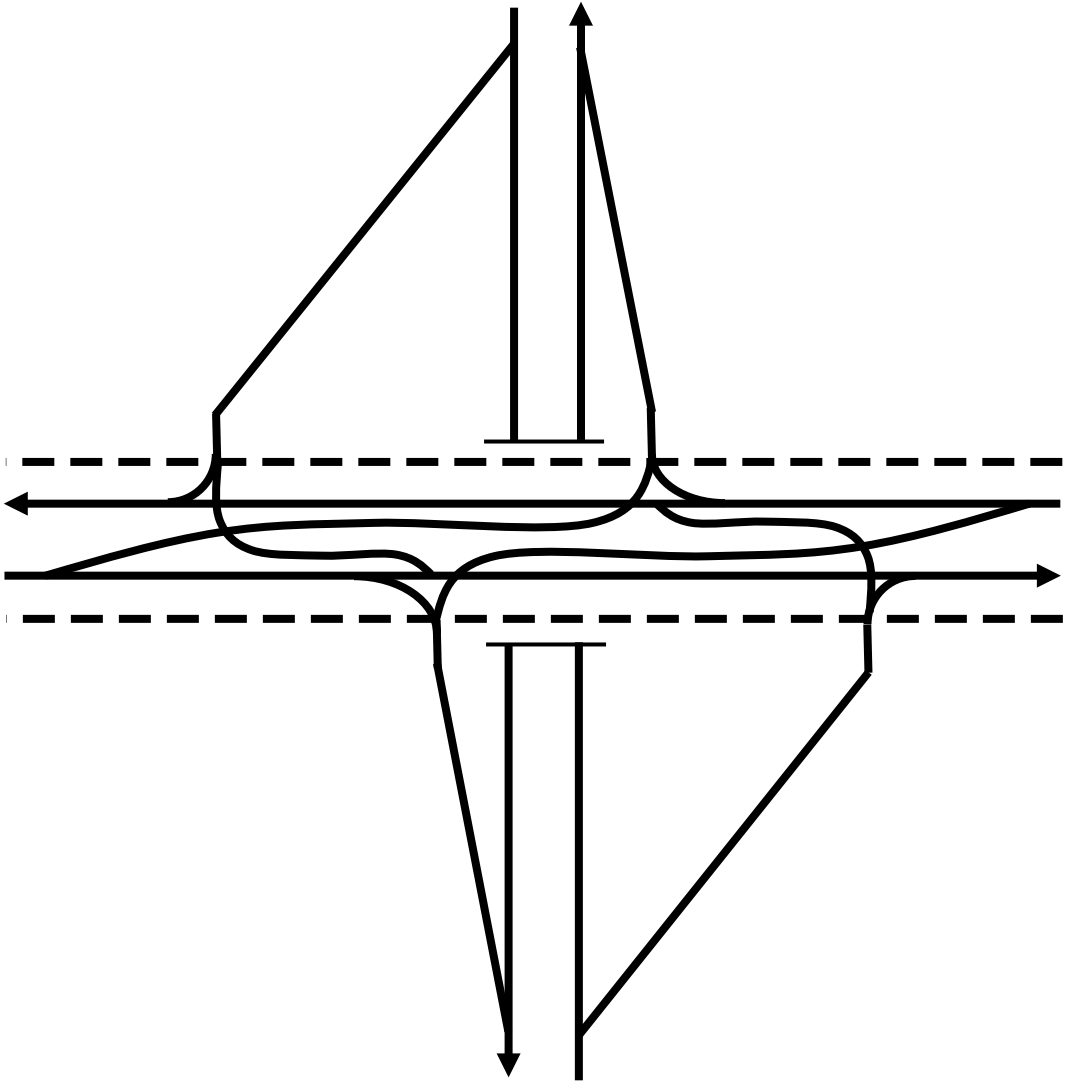
# eeDD, Offset Diamond

**Summary:** Supplies good efficiency with great progression but has a large number of conflict points.  
Could be a parclo A retrofit.

**History:** First published by Molan and Hummer, 2020.

**Rank:** 45 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 5           | 4                 | 1               | 3                 | 2                   | 4                  | 3           | 3                 | 3                    | 2                     | 12                 | 10             | 11           | 33            |



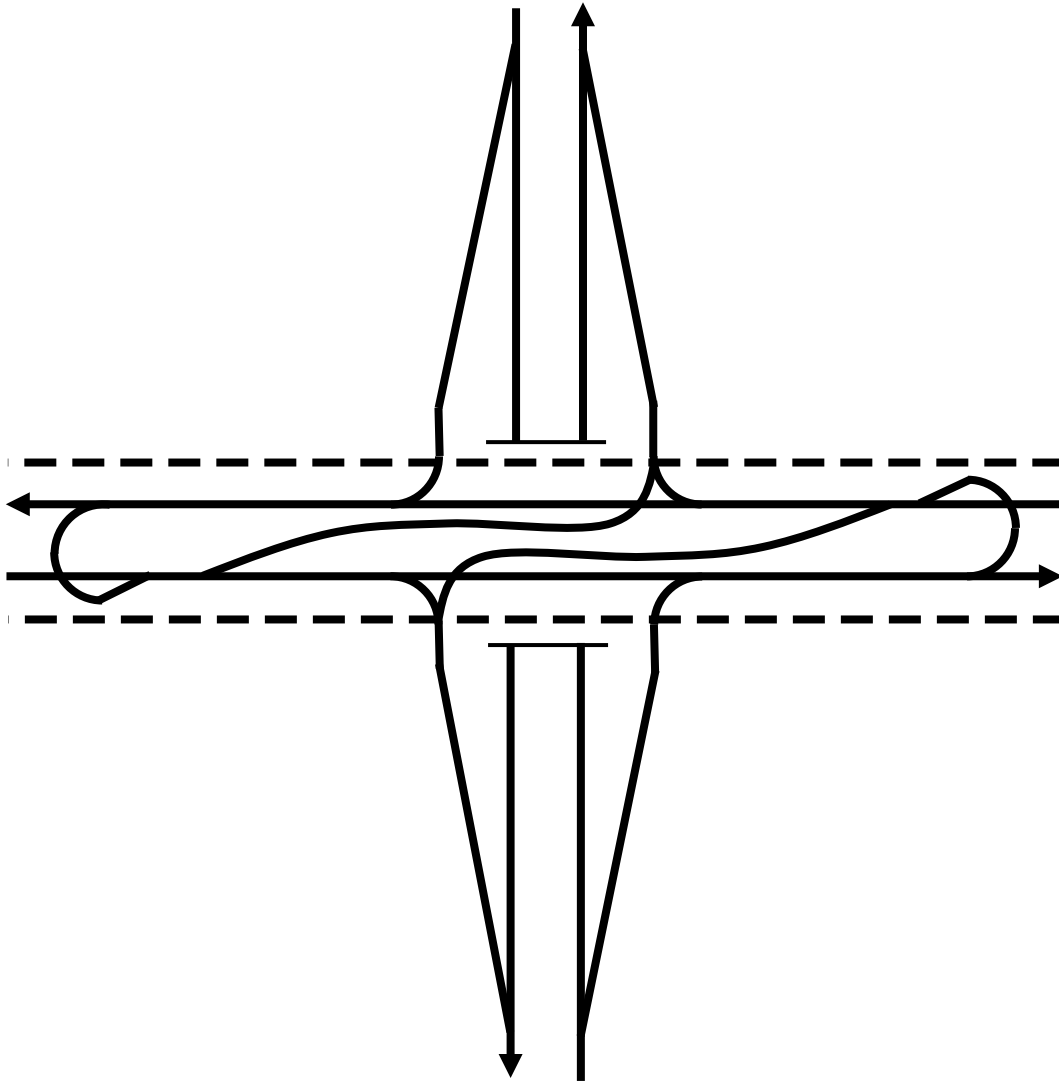
## eeJJ, Synchronized

**Summary:** Supplies great cost scores with good efficiency and safety performance. This design has no major weaknesses based on our analysis. If project teams can find the space for the u-turn crossovers this design should be competitive.

**History:** This design was first published by Molan and Hummer, 2018.

**Rank:** 2 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 3                 | 3               | 3                 | 4                   | 4                  | 3           | 5                 | 5                    | 4                     | 12                 | 14             | 17           | 43            |





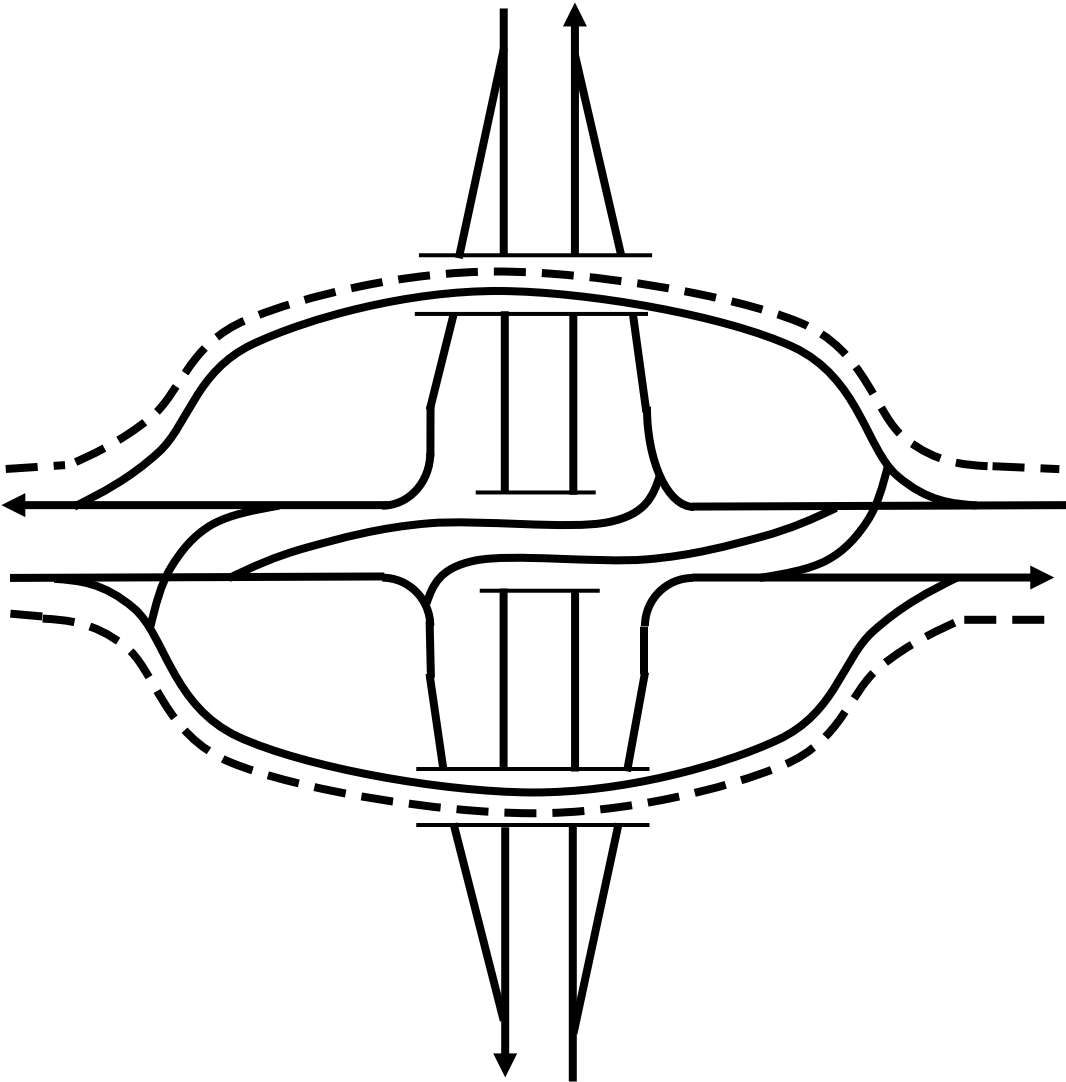
# eeJJ, Synchronized with Two One-Way Bypasses

**Summary:** Supplies good safety and cost scores with a slightly smaller main bridge than the original Synchronized design but requires extensive travel distances and much more right of way.

**History:** This is a new design.

**Rank:** 16 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 0                 | 3               | 4                 | 3                   | 4                  | 4           | 2                 | 5                    | 3                     | 9                  | 14             | 14           | 37            |



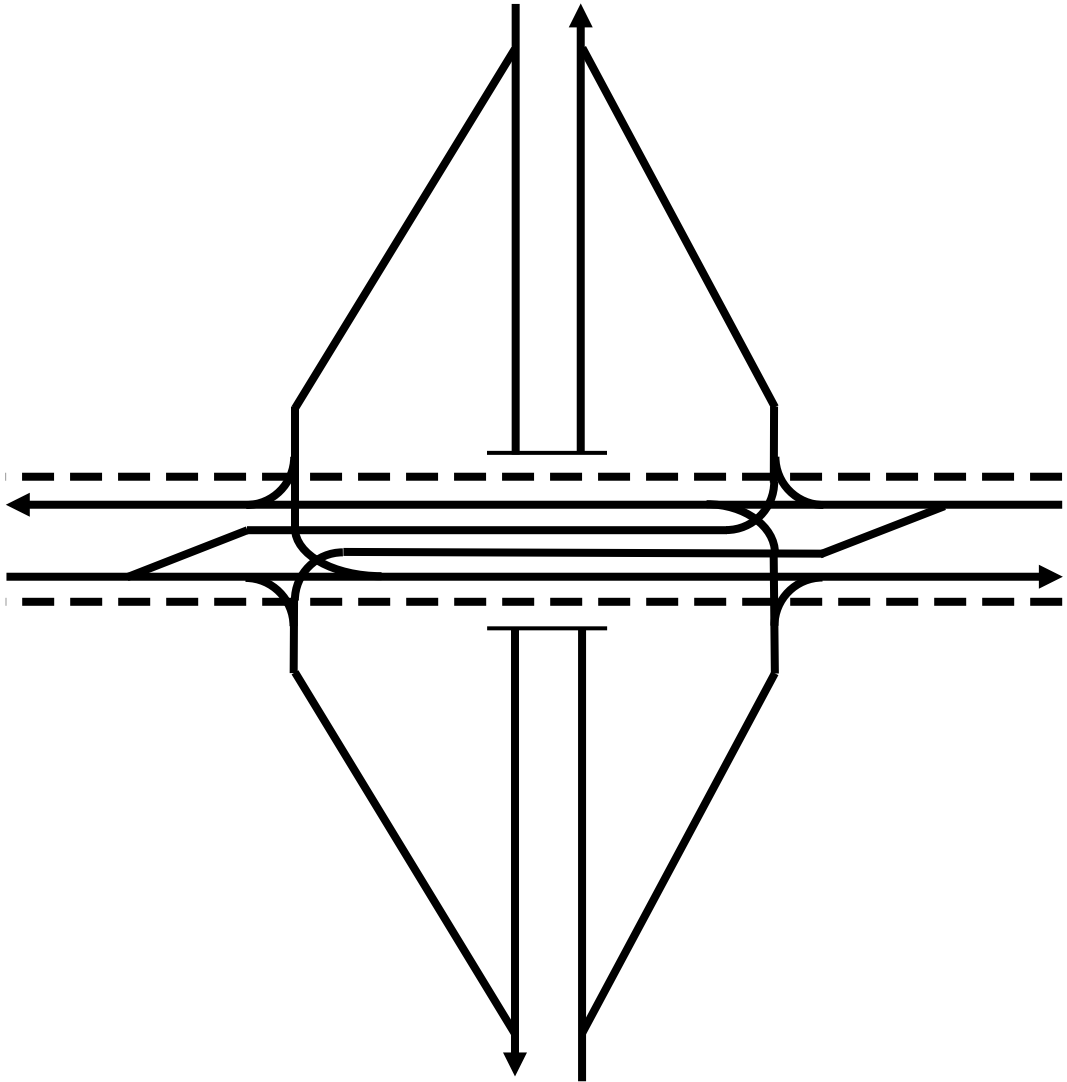
### ffCC, Contraflow

**Summary:** Supplies good cost scores but has poor progression and a large number of conflict points.  
Has higher capacity than a diamond but earns fewer safety points.

**History:** A contraflow interchange exists at FL-869 and Lyons Road in Coconut Creek, Florida.

**Rank:** 79 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 0           | 4                 | 0               | 3                 | 2                   | 4                  | 3           | 4                 | 4                    | 3                     | 7                  | 9              | 14           | 30            |



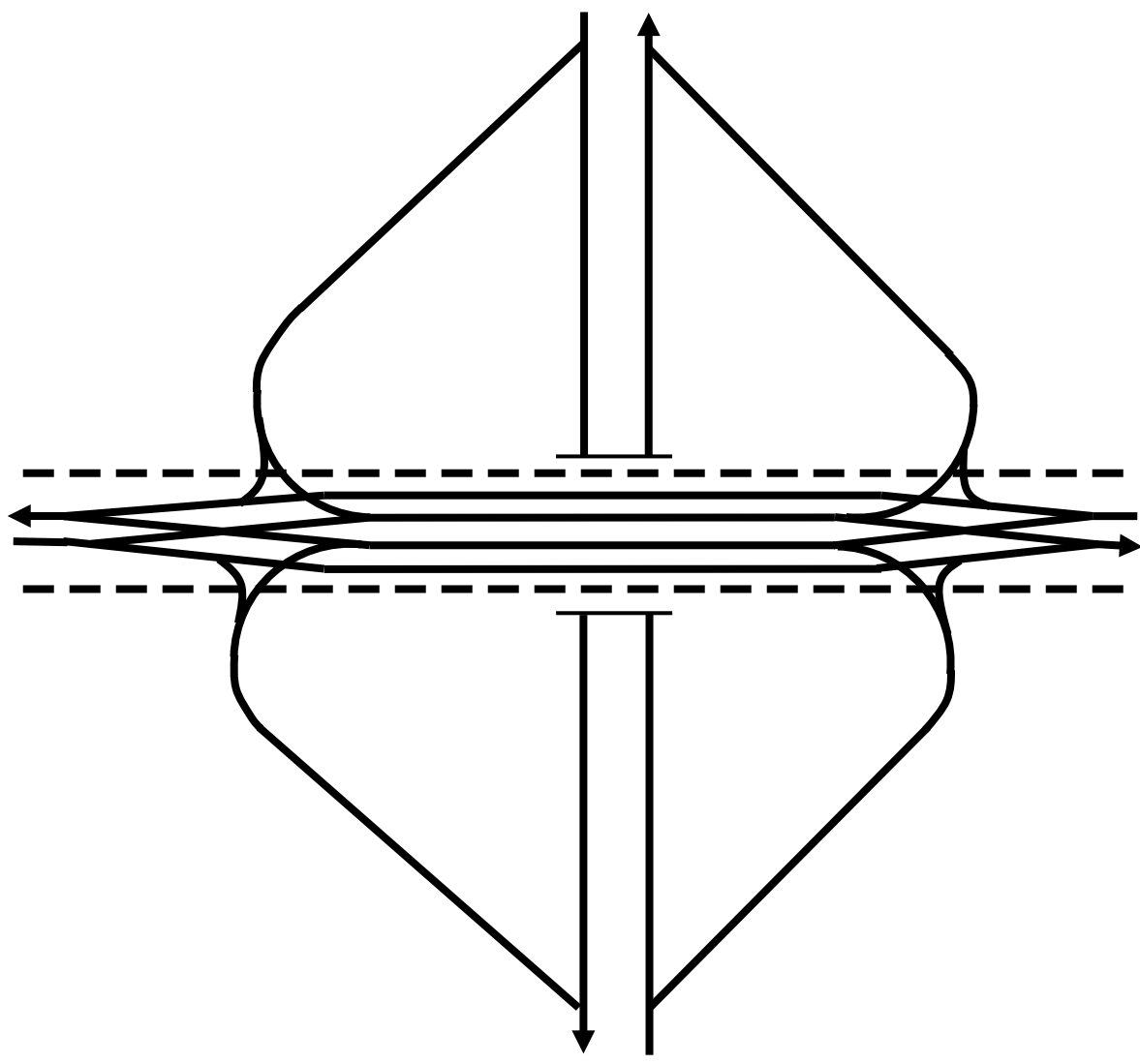
# ffFF, Super DDI

**Summary:** Supplies good cost scores. Has great capacity, but a large number of conflict points and high wrong way potential.

**History:** First published by Molan, et. al., 2019.

**Rank:** 44 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 1           | 4                 | 0               | 4                 | 1                   | 4                  | 3           | 4                 | 4                    | 3                     | 10                 | 9              | 14           | 33            |



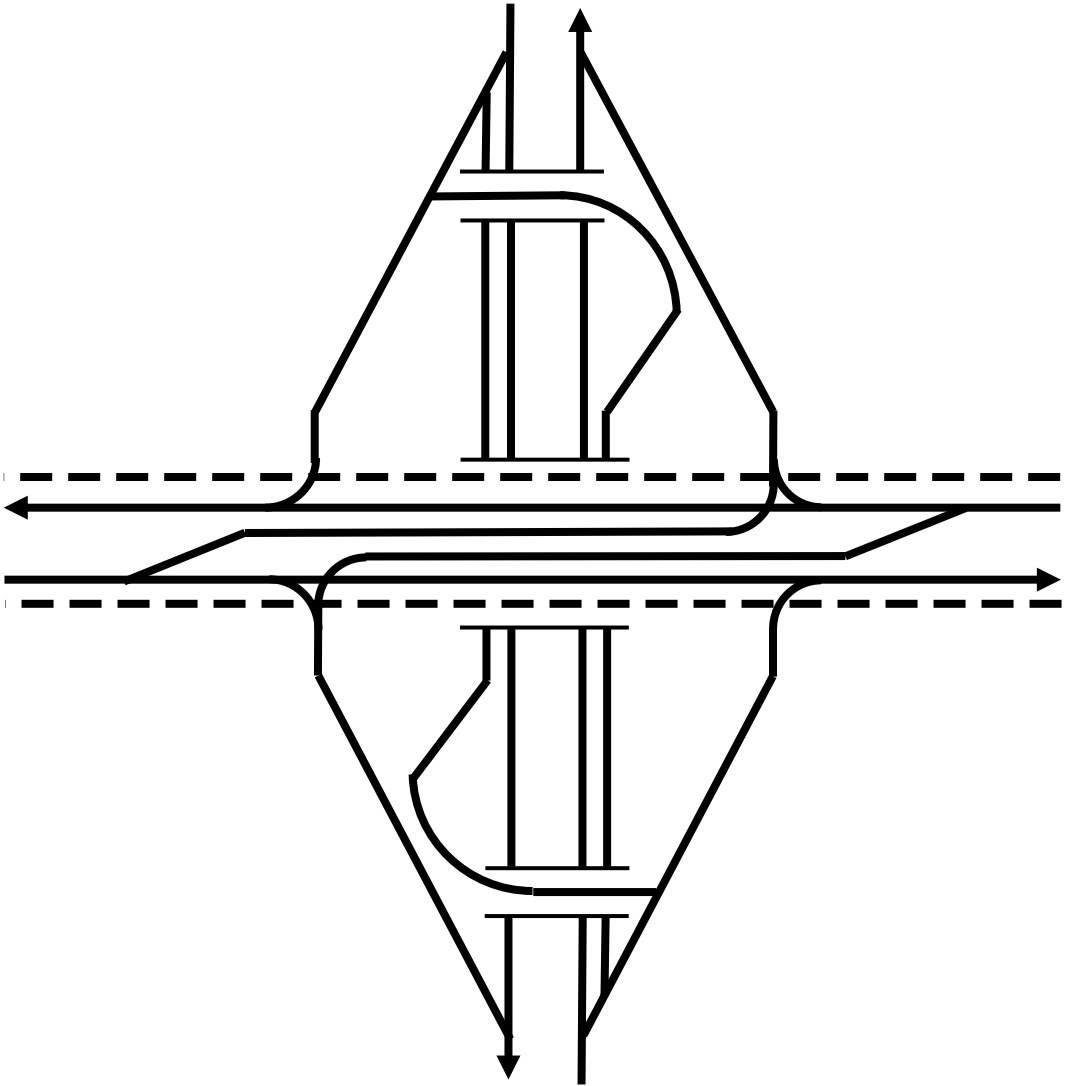
ffLL, Milwaukee B

**Summary:** Supplies good efficiency and safety, but has poor cost performance. Requires a large bridge, a large right of way, and a lengthy extent along the freeway.

**History:** This design was first published by Molan and Hummer, 2018.

**Rank:** 65 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 2                 | 3               | 4                 | 4                   | 4                  | 0           | 0                 | 1                    | 3                     | 12                 | 15             | 4            | 31            |



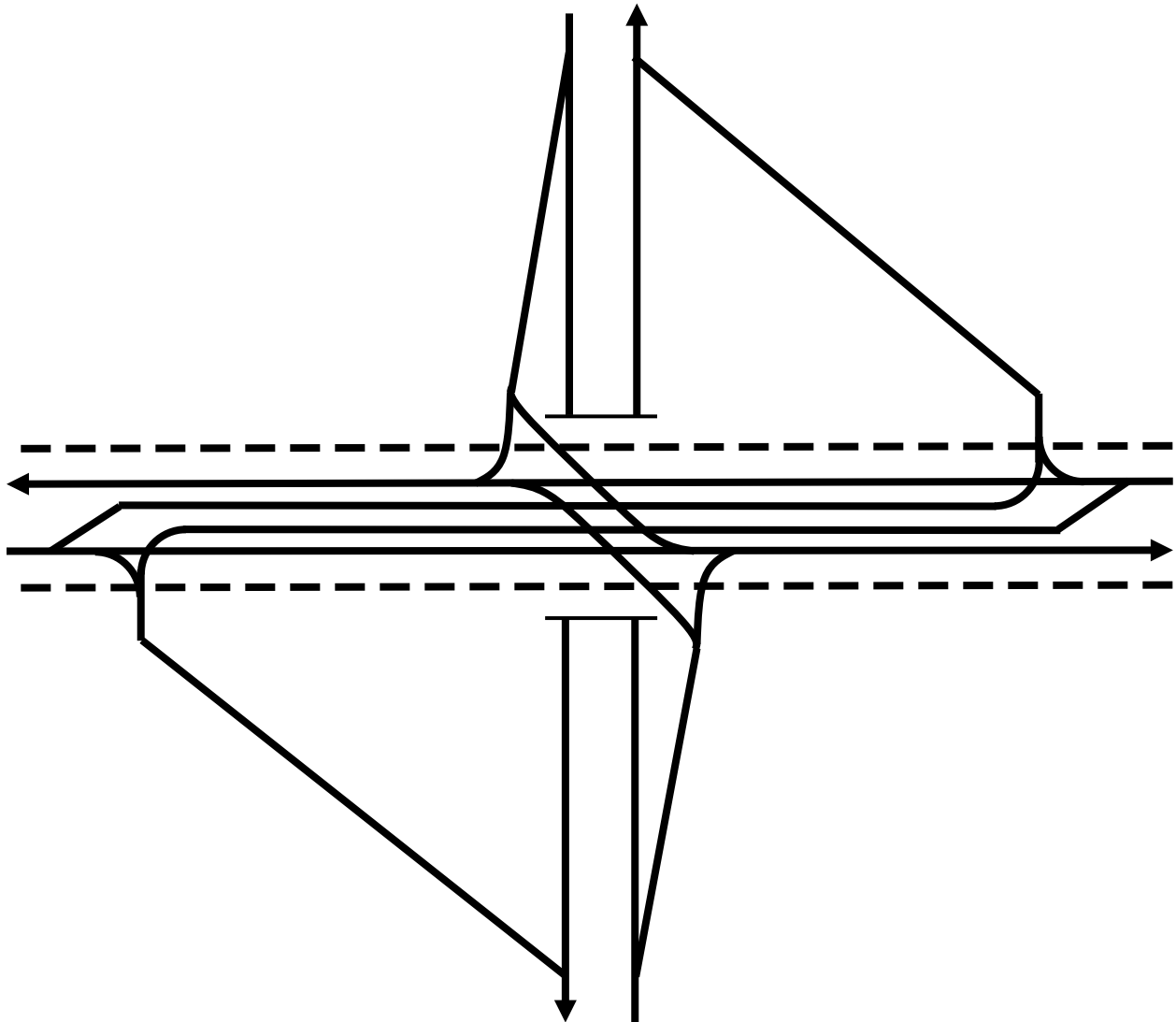
## ggAA, Spread Contraflow Single Point

**Summary:** Supplies good efficiency in a small right of way. Requires a large bridge and results in a large number of conflict points.

**History:** This is a new design.

**Rank:** 81 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 3           | 3                 | 0               | 3                 | 1                   | 4                  | 1           | 4                 | 3                    | 2                     | 11                 | 8              | 10           | 29            |



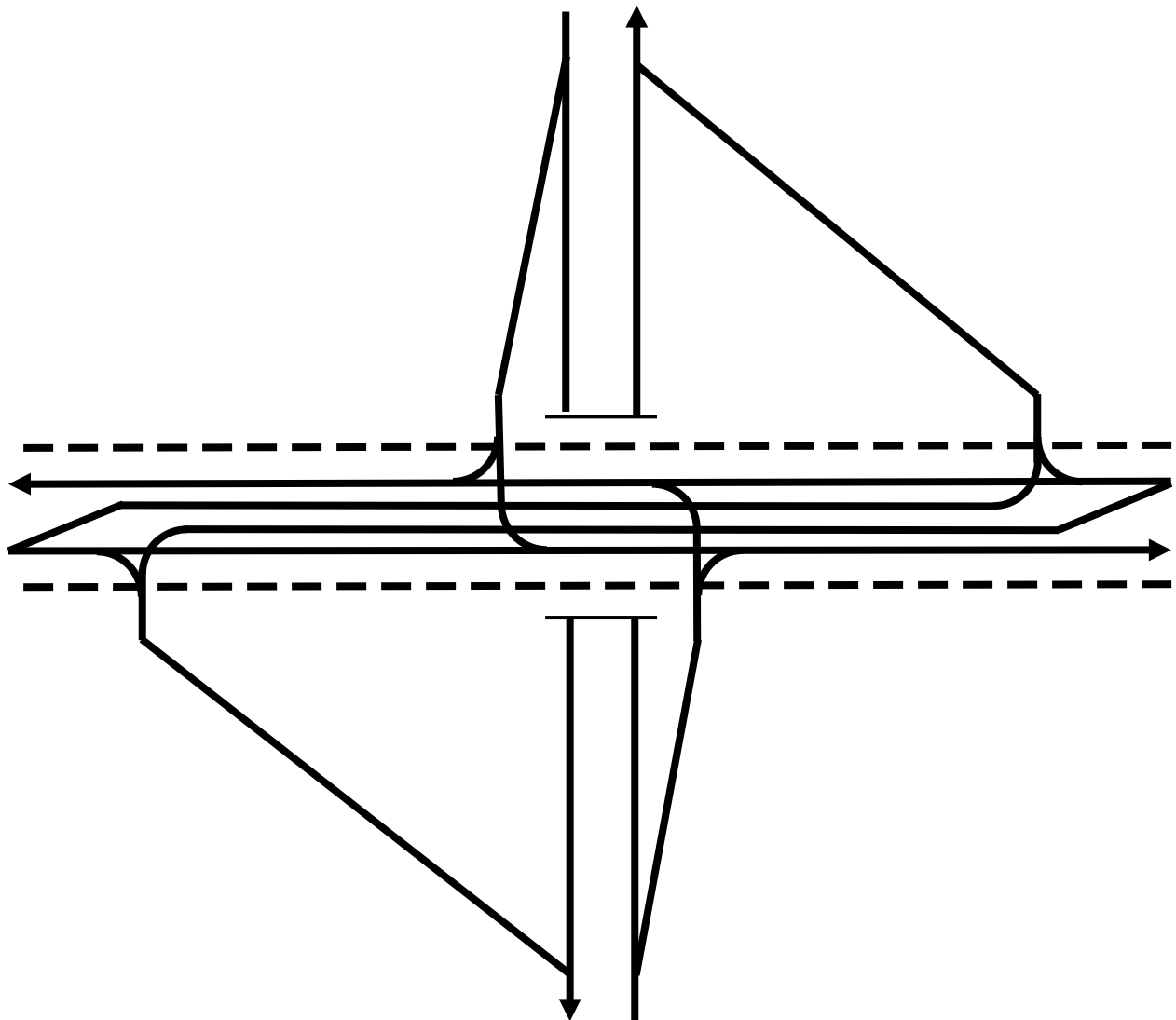
## ggBB, Spread Contraflow Tight Diamond

**Summary:** Supplies average efficiency, safety, and cost performance. Has a high number of conflict points.

**History:** This is a new design.

**Rank:** 72 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 3           | 4                 | 0               | 3                 | 2                   | 4                  | 3           | 4                 | 3                    | 2                     | 10                 | 9              | 12           | 31            |



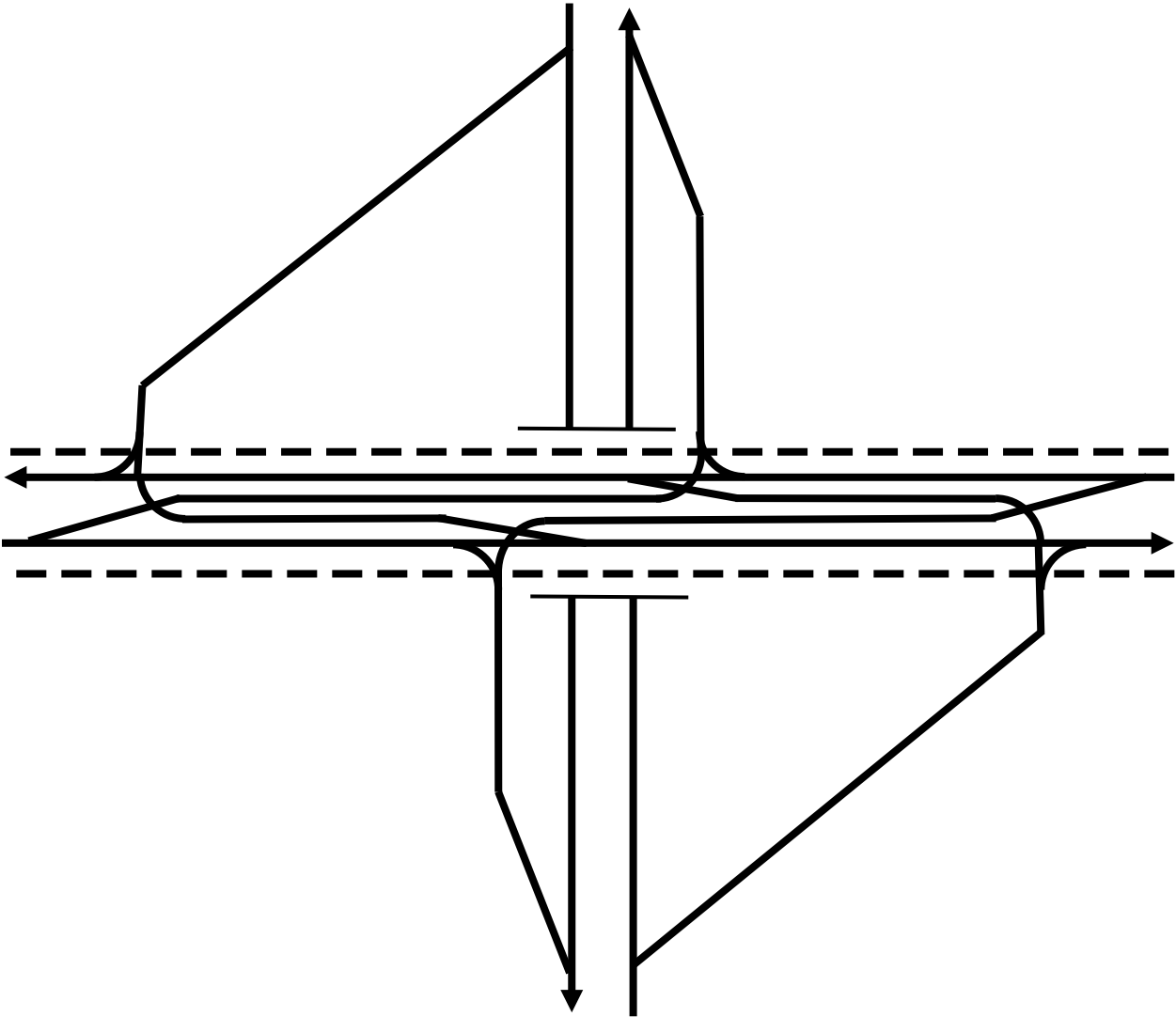
# ggGG, Spread Contraflow

**Summary:** Supplies good efficiency with average safety and cost scores. This design is great for progression but has a large number of conflict points.

**History:** This is a new design.

**Rank:** 62 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 5           | 4                 | 0               | 3                 | 2                   | 4                  | 3           | 3                 | 3                    | 2                     | 12                 | 9              | 11           | 32            |



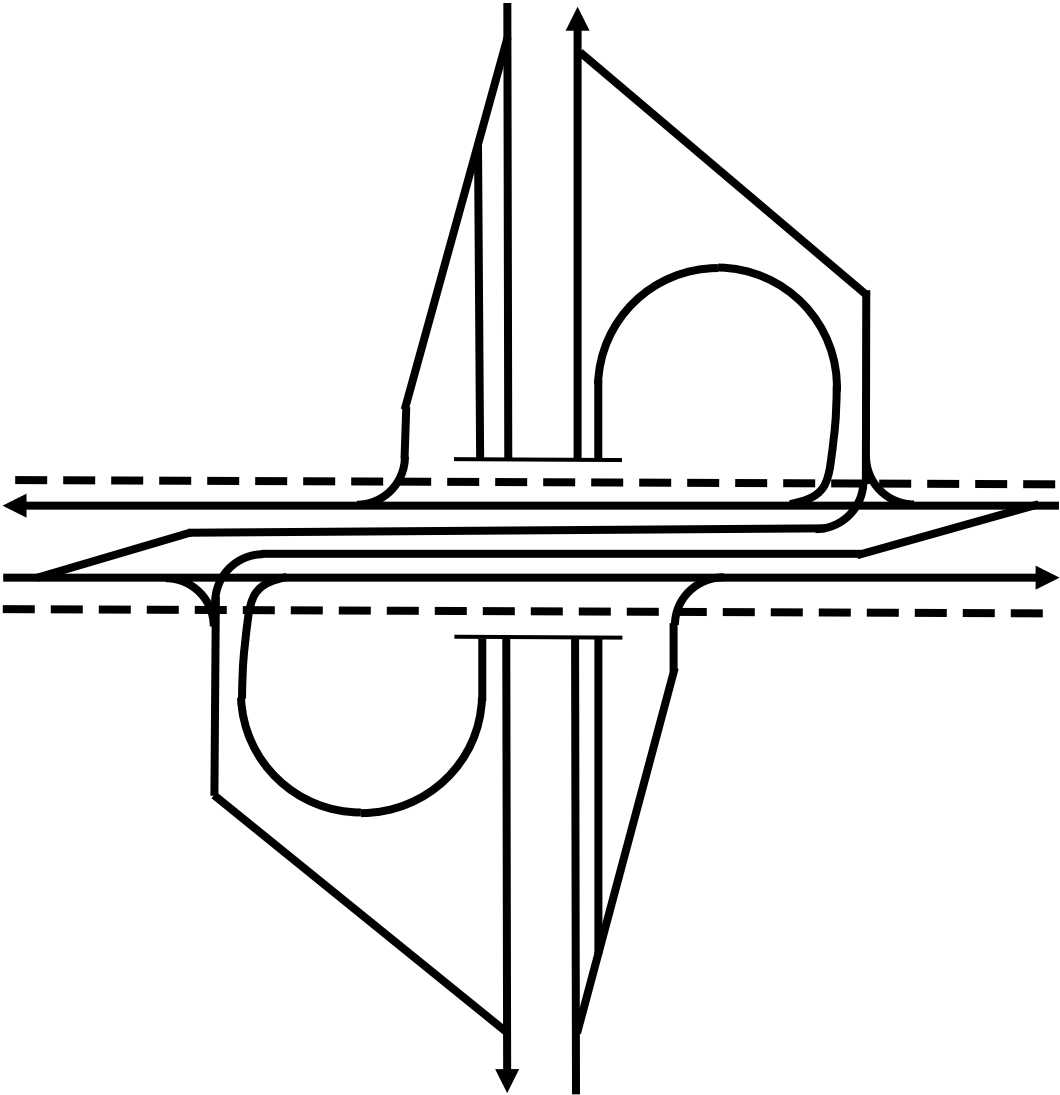
ggl, Folded

**Summary:** Supplies good efficiency and safety but has poor cost performance. This design has great capacity and progression. Could be a cloverleaf retrofit.

**History:** First published by Riniker, 2009. Under construction at I-26 and US-64 in Hendersonville, NC.

**Rank:** 39 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 1                 | 3               | 4                 | 4                   | 3                  | 2           | 2                 | 2                    | 2                     | 11                 | 14             | 8            | 33            |





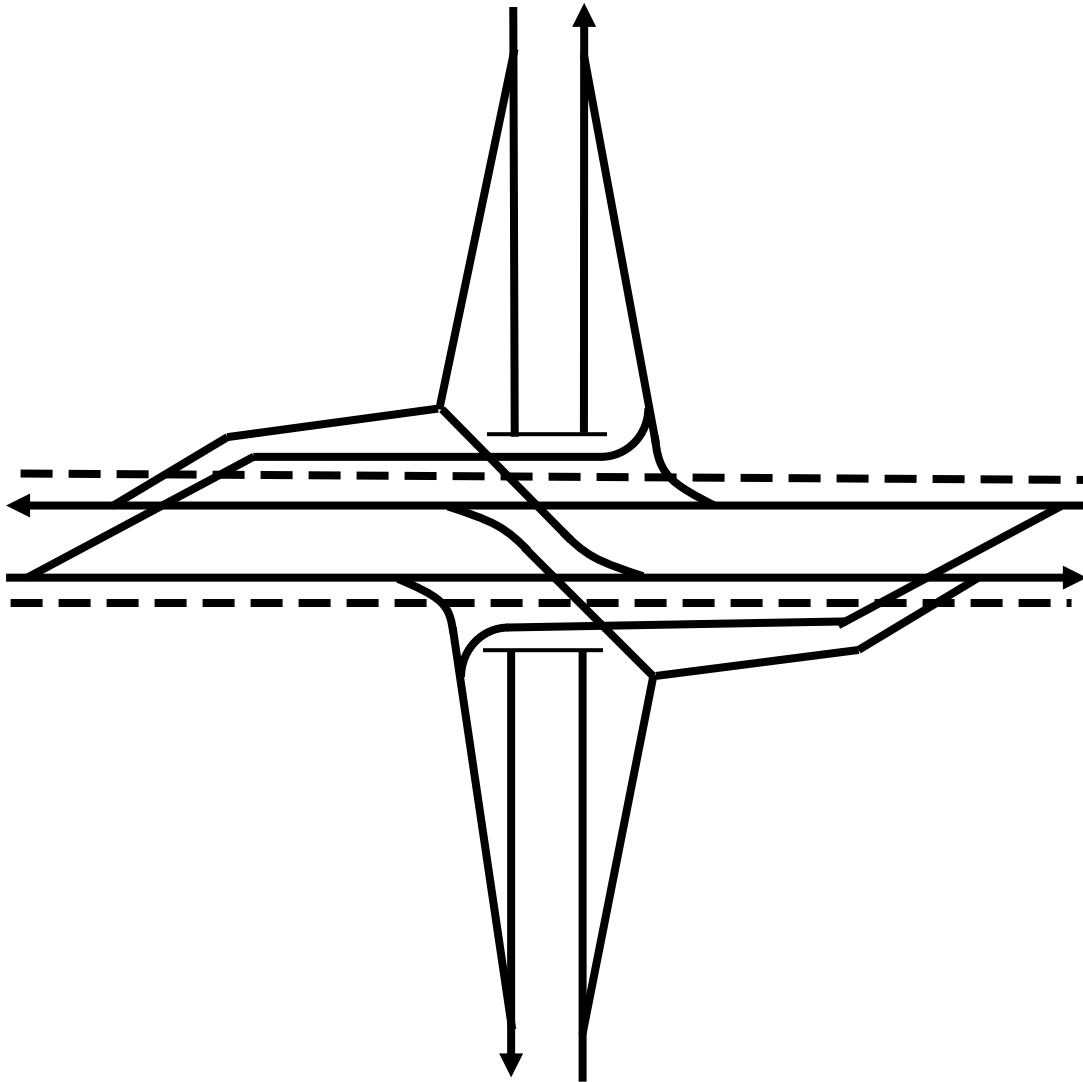
## hhAA, Displaced Single Point

**Summary:** Supplies great efficiency, poor safety, and good cost scores. Has a high number of conflict points, high wrong way potential, poor pedestrian quality, and requires a large bridge.

**History:** This is a new design.

**Rank:** 61 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 4           | 5                 | 1               | 3                 | 0                   | 1                  | 1           | 5                 | 5                    | 2                     | 14                 | 5              | 13           | 32            |



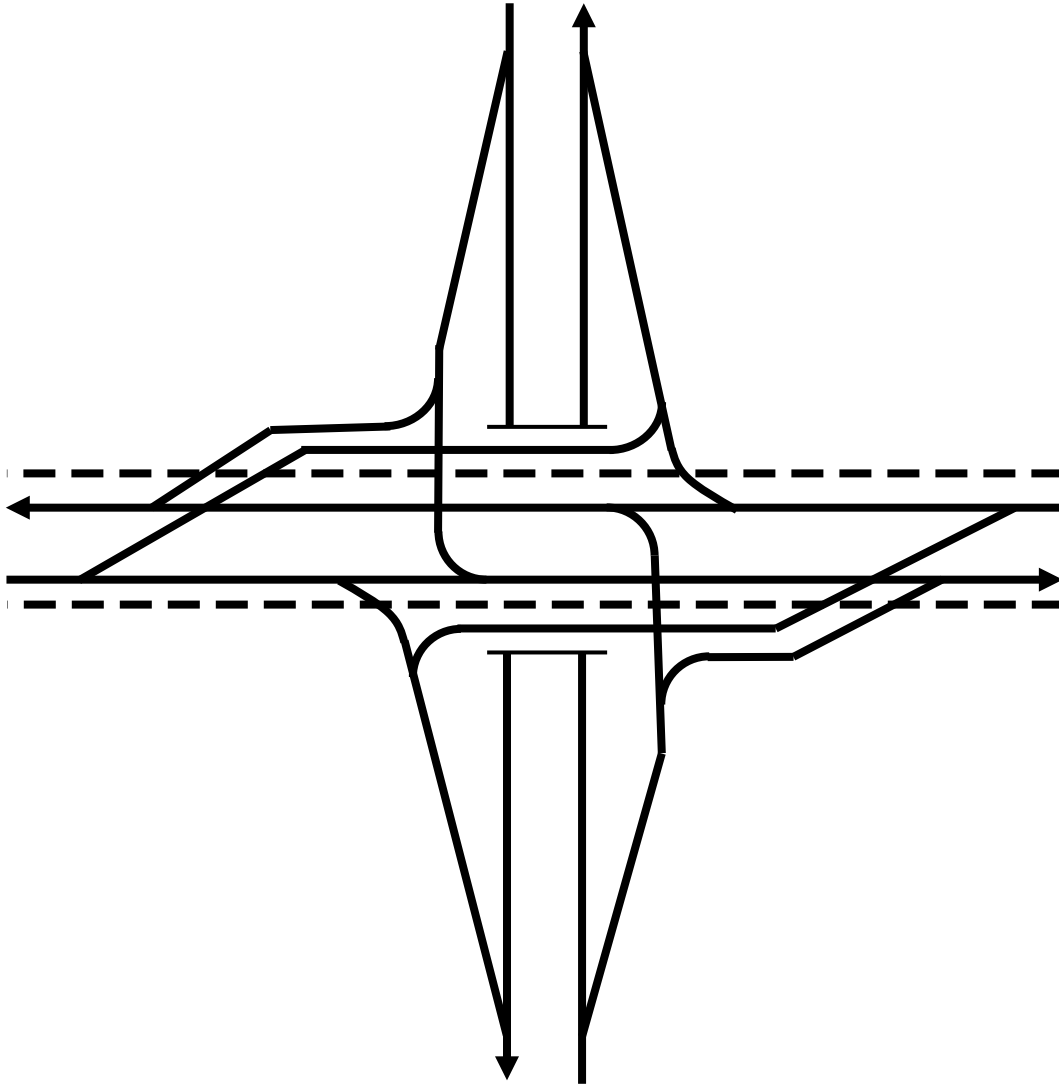
## hhBB, Displaced Tight Diamond

**Summary:** Supplies good efficiency and cost but has poor safety performance. Has a high number of conflict points and a high wrong way potential.

**History:** This is a new design.

**Rank:** 53 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 3           | 5                 | 1               | 3                 | 1                   | 2                  | 3           | 5                 | 5                    | 2                     | 11                 | 7              | 15           | 33            |



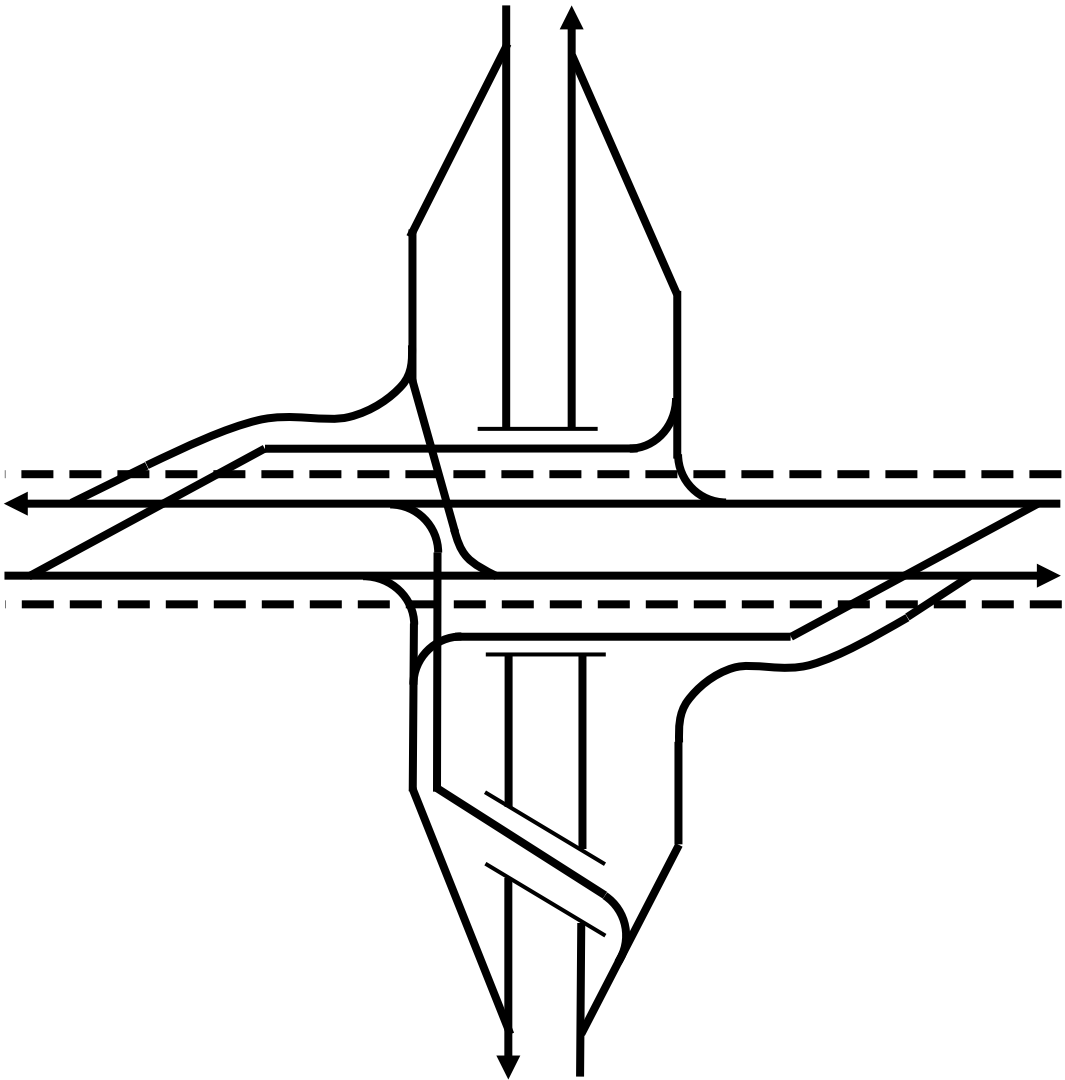
# hhBH, Three Fourths Displaced

**Summary:** Supplies great efficiency but has a large number of conflict points and a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 34 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 5                 | 1               | 3                 | 2                   | 3                  | 4           | 4                 | 3                    | 1                     | 13                 | 9              | 12           | 34            |



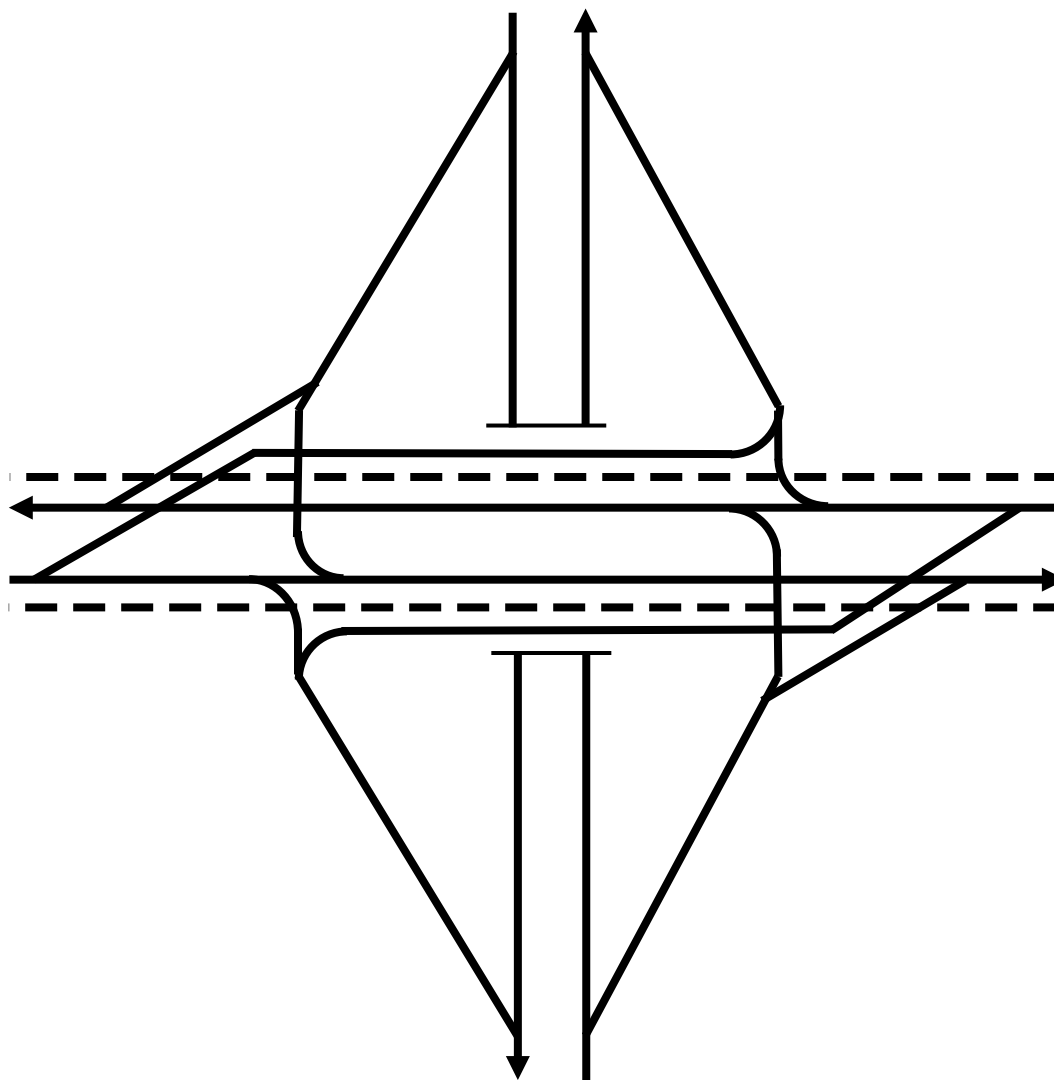
## hhCC, Displaced Left

**Summary:** Supplies poor safety performance with poor progression and a lengthy extent along the arterial. Has good capacity, short travel distances, and short extents along the freeway.

**History:** Published by Hughes, W. et. al., 2010. Several have been built on I-35 in Texas.

**Rank:** 106 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 1           | 4                 | 1               | 3                 | 1                   | 1                  | 3           | 3                 | 4                    | 0                     | 9                  | 6              | 10           | 25            |



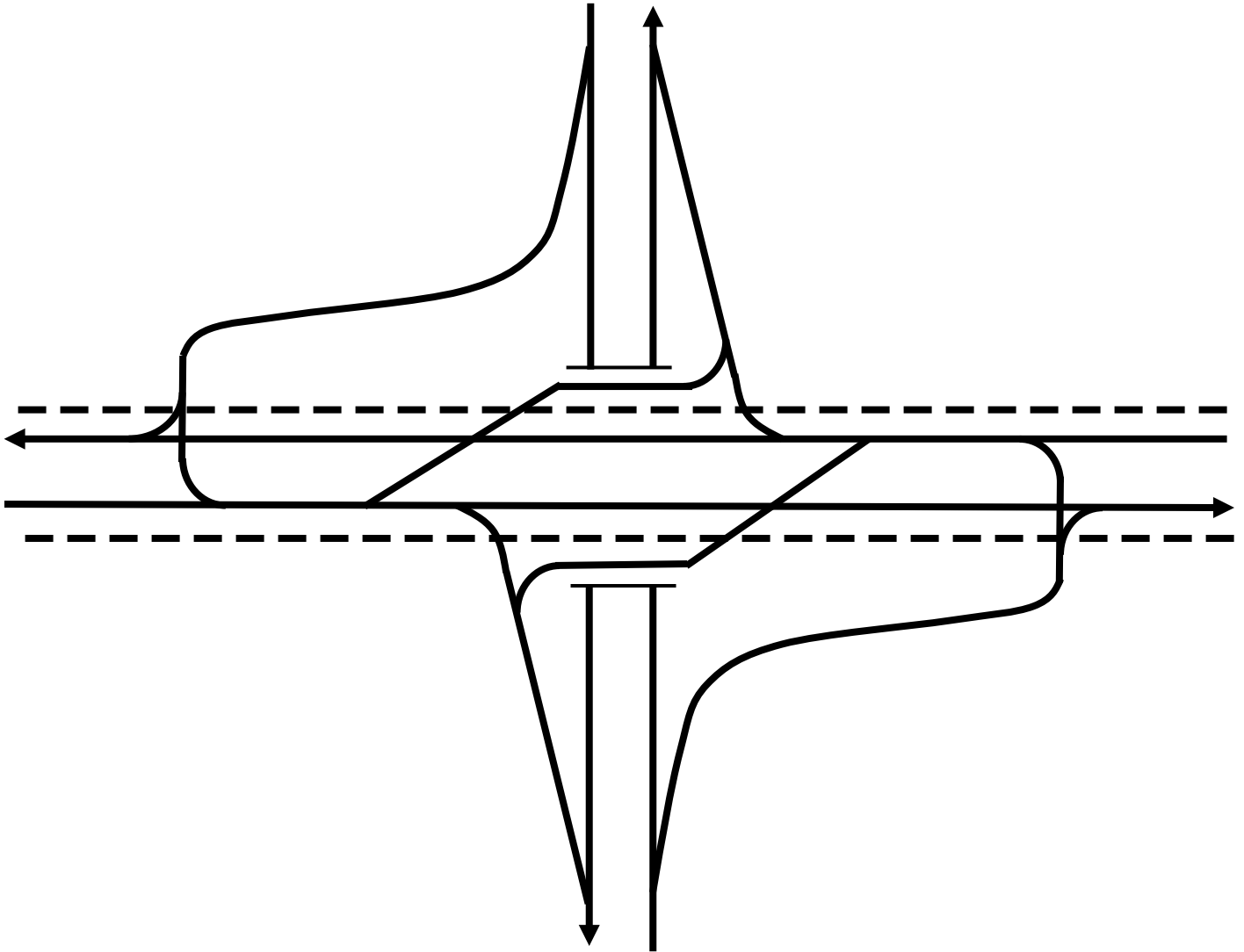
## hhDD, Displaced Spread Diamond

**Summary:** Supplies average efficiency, safety, and cost scores. Has good capacity, short travel distances, and a small number of unusual maneuvers, but has poor progression.

**History:** This is a new design.

**Rank:** 64 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 1           | 4                 | 2               | 4                 | 2                   | 3                  | 4           | 3                 | 3                    | 2                     | 9                  | 11             | 12           | 32            |



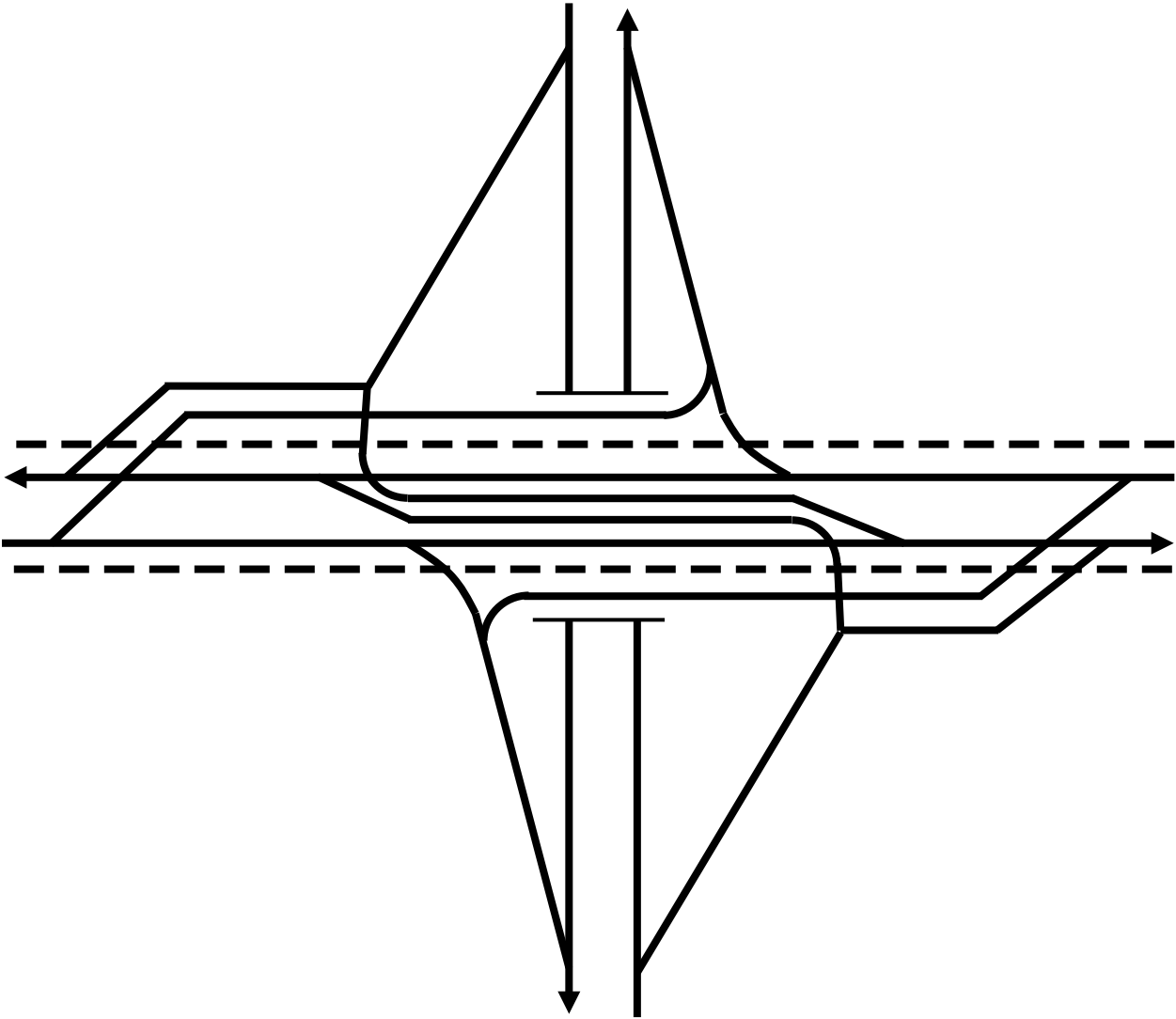
# hhFF, Displaced Standard Contraflow

**Summary:** Supplies great efficiency in a small right of way. Has poor safety and cost performance.  
Requires a large bridge and results in a large number of conflict points.

**History:** This is a new design.

**Rank:** 84 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 4                 | 1               | 3                 | 2                   | 2                  | 0           | 4                 | 4                    | 0                     | 13                 | 8              | 8            | 29            |



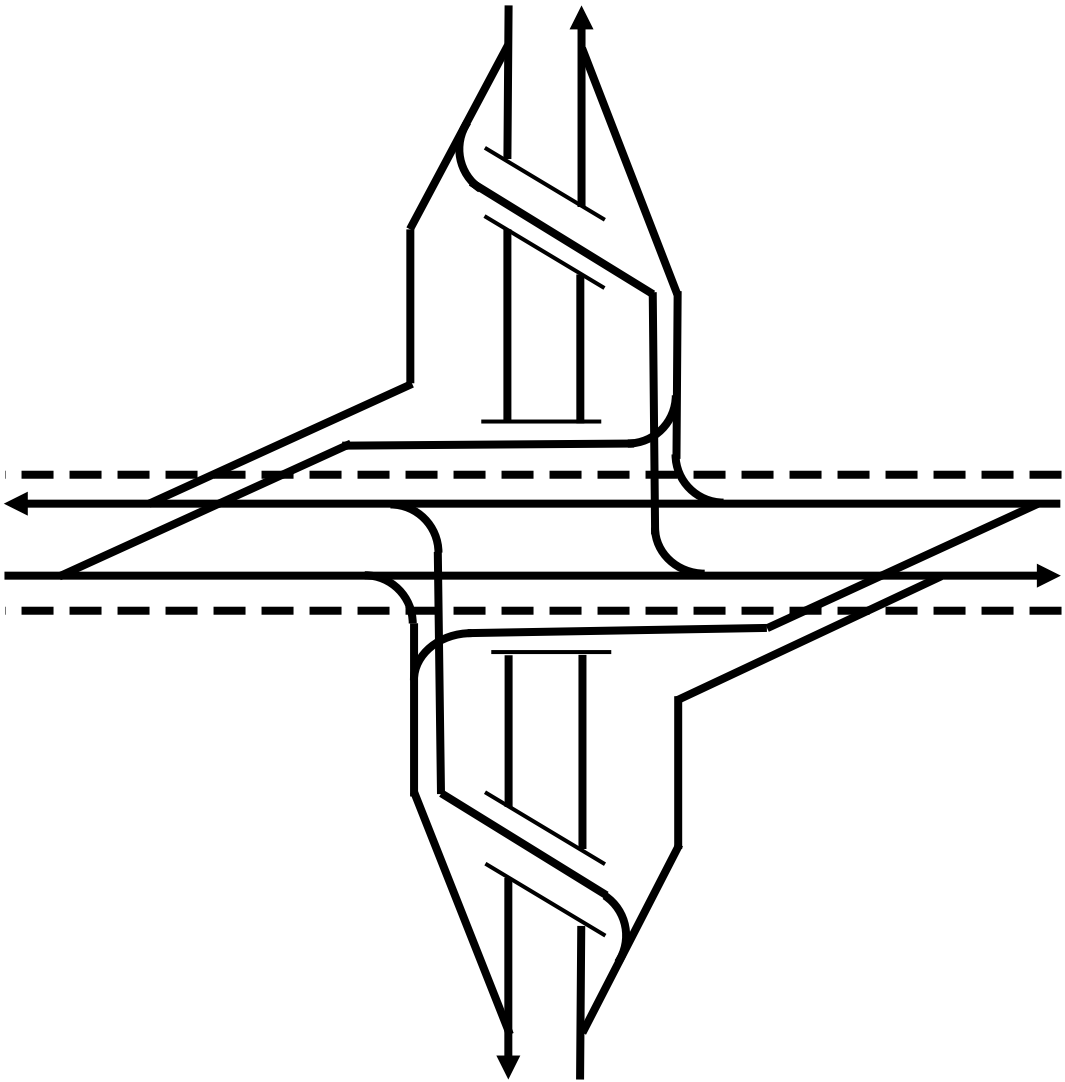
# hhHH, Displaced Displaced

**Summary:** Supplies great efficiency but has poor safety and cost performance. Has high number of conflict points and high wrong way potential.

**History:** This is a new design.

**Rank:** 94 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 5                 | 1               | 3                 | 0                   | 2                  | 2           | 3                 | 2                    | 2                     | 13                 | 6              | 9            | 28            |



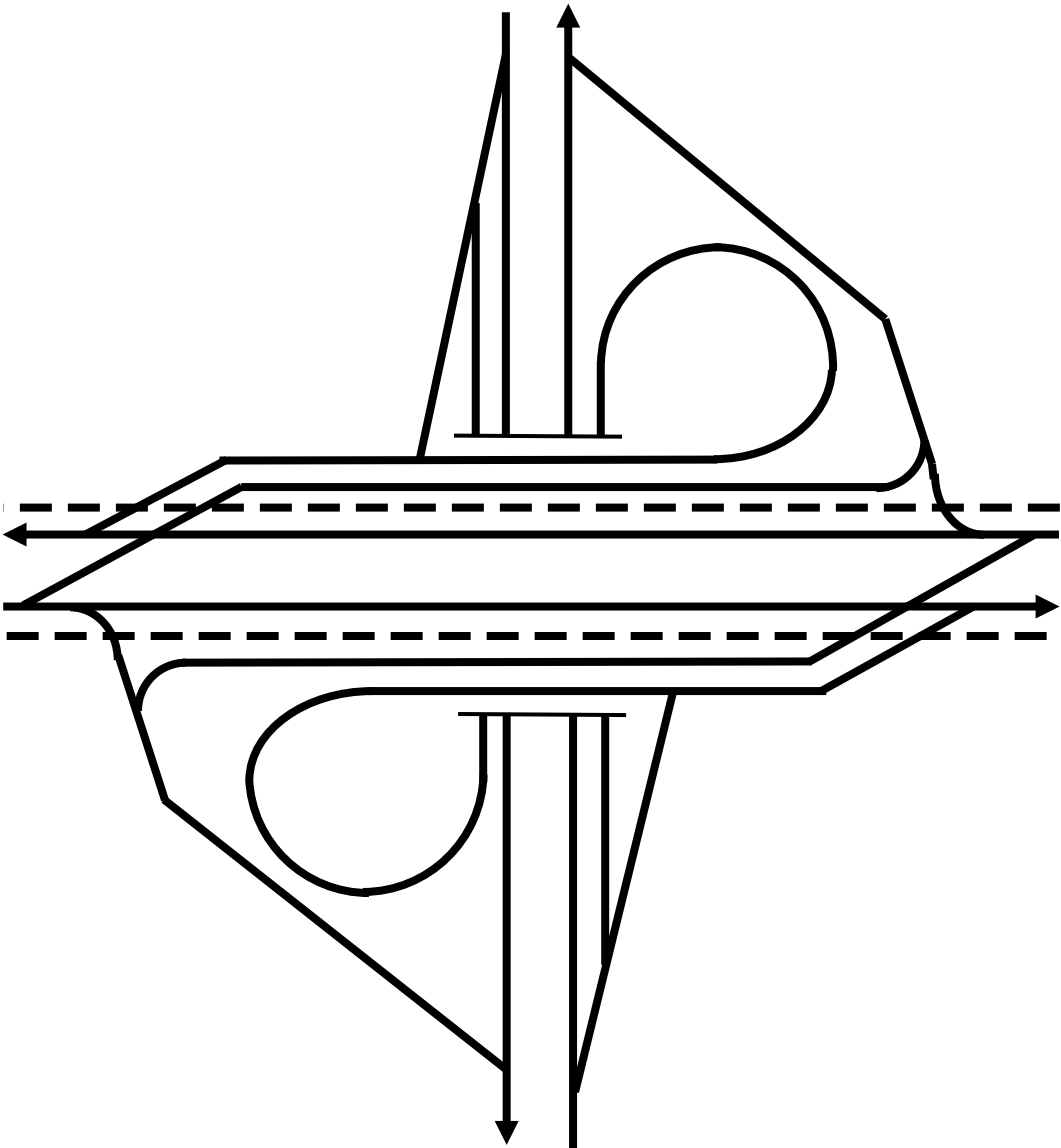
# hhll, Continuous Flow

**Summary:** Supplies good efficiency with a low number of unusual maneuvers and low wrong way potential. Has poor pedestrian performance and a lengthy extent along the arterial.

**History:** This design may have been patented at one point, but the possible patent expired in 2003.

**Rank:** 80 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 1                 | 3               | 4                 | 4                   | 1                  | 2           | 2                 | 2                    | 0                     | 11                 | 12             | 6            | 29            |





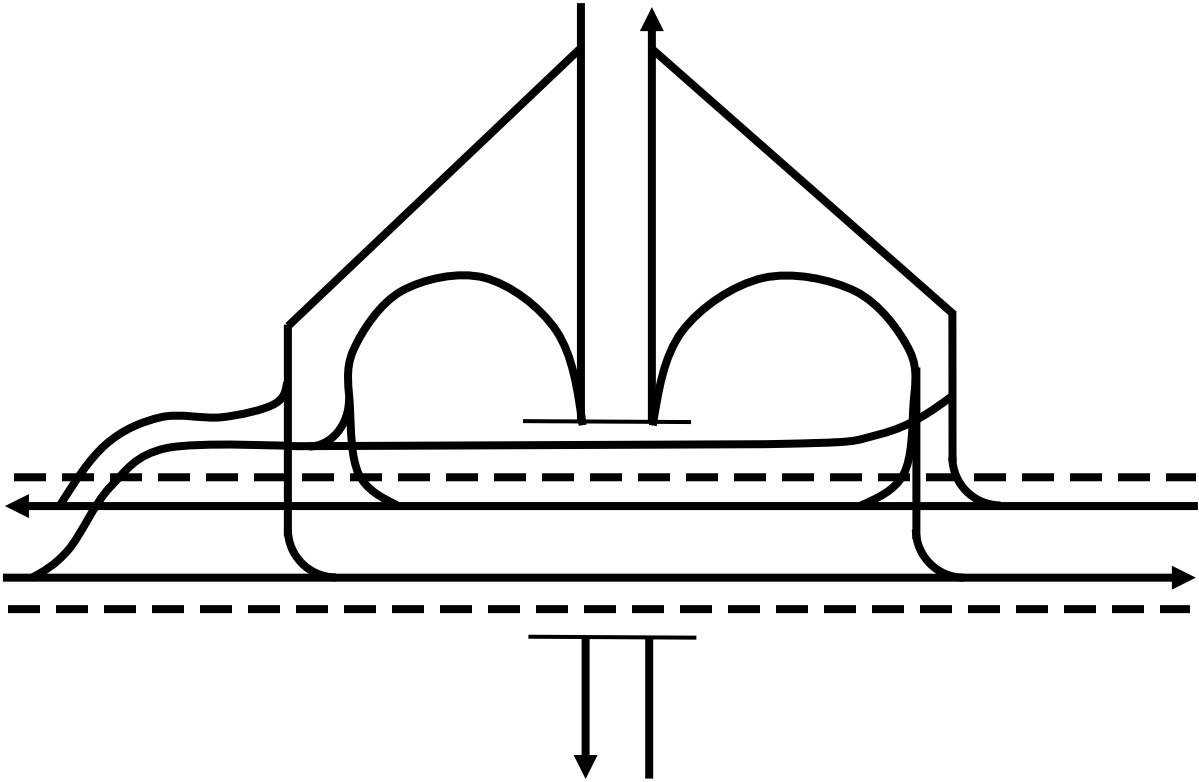
# hiDI, Parco AB with CFI

**Summary:** Supplies poor efficiency and average safety and cost performance. Requires small extents along the freeway but lengthy travel distances.

**History:** This is a new design.

**Rank:** 107 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 1           | 0                 | 1               | 3                 | 1                   | 4                  | 1           | 2                 | 5                    | 1                     | 3                  | 9              | 9            | 21            |



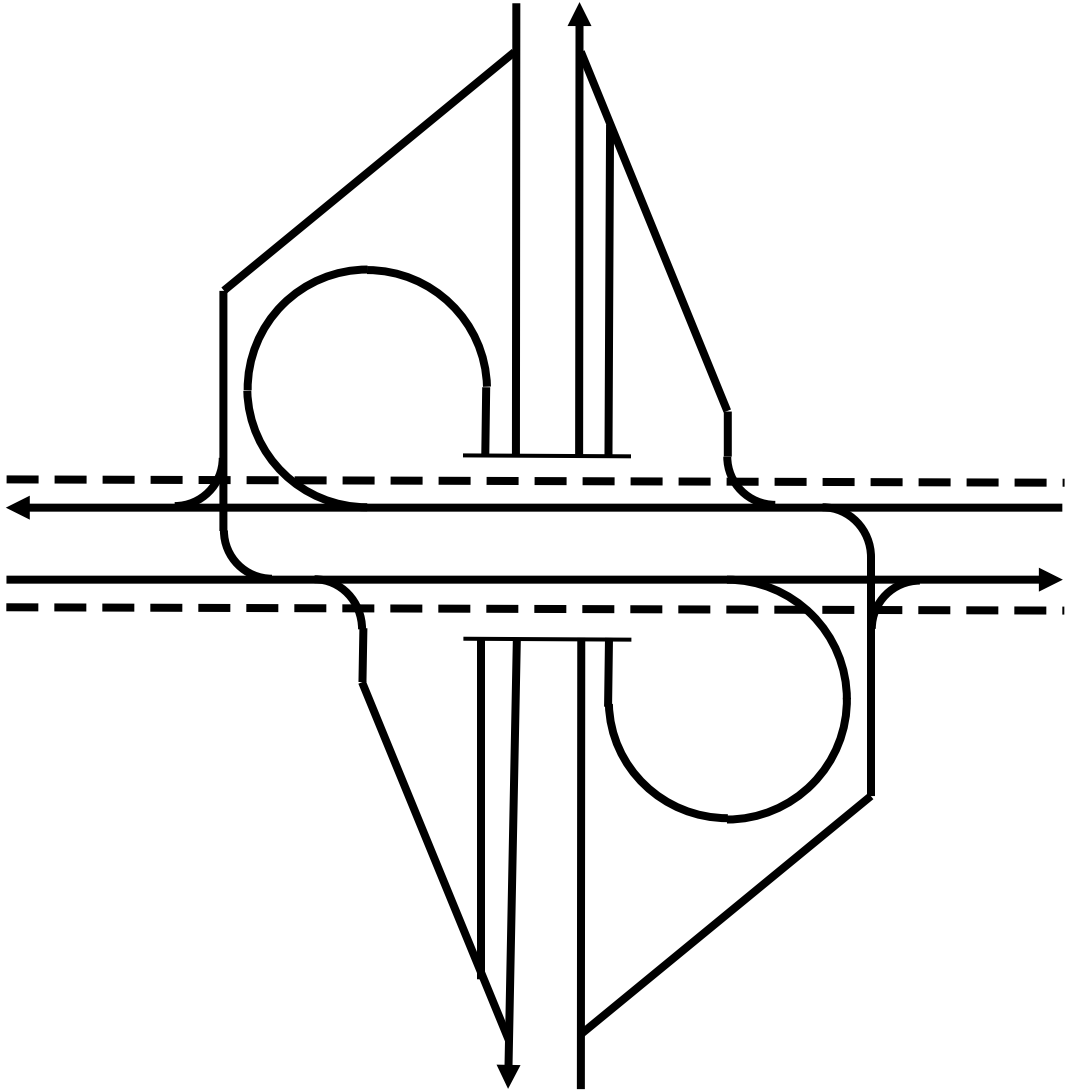
iiDD, Parclo A

**Summary:** Supplies poor efficiency and average safety and cost scores. Requires a small bridge but has lengthy travel distances.

**History:** This is a common design.

**Rank:** 77 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 1           | 1                 | 3               | 4                 | 4                   | 2                  | 5           | 2                 | 2                    | 2                     | 6                  | 13             | 11           | 30            |



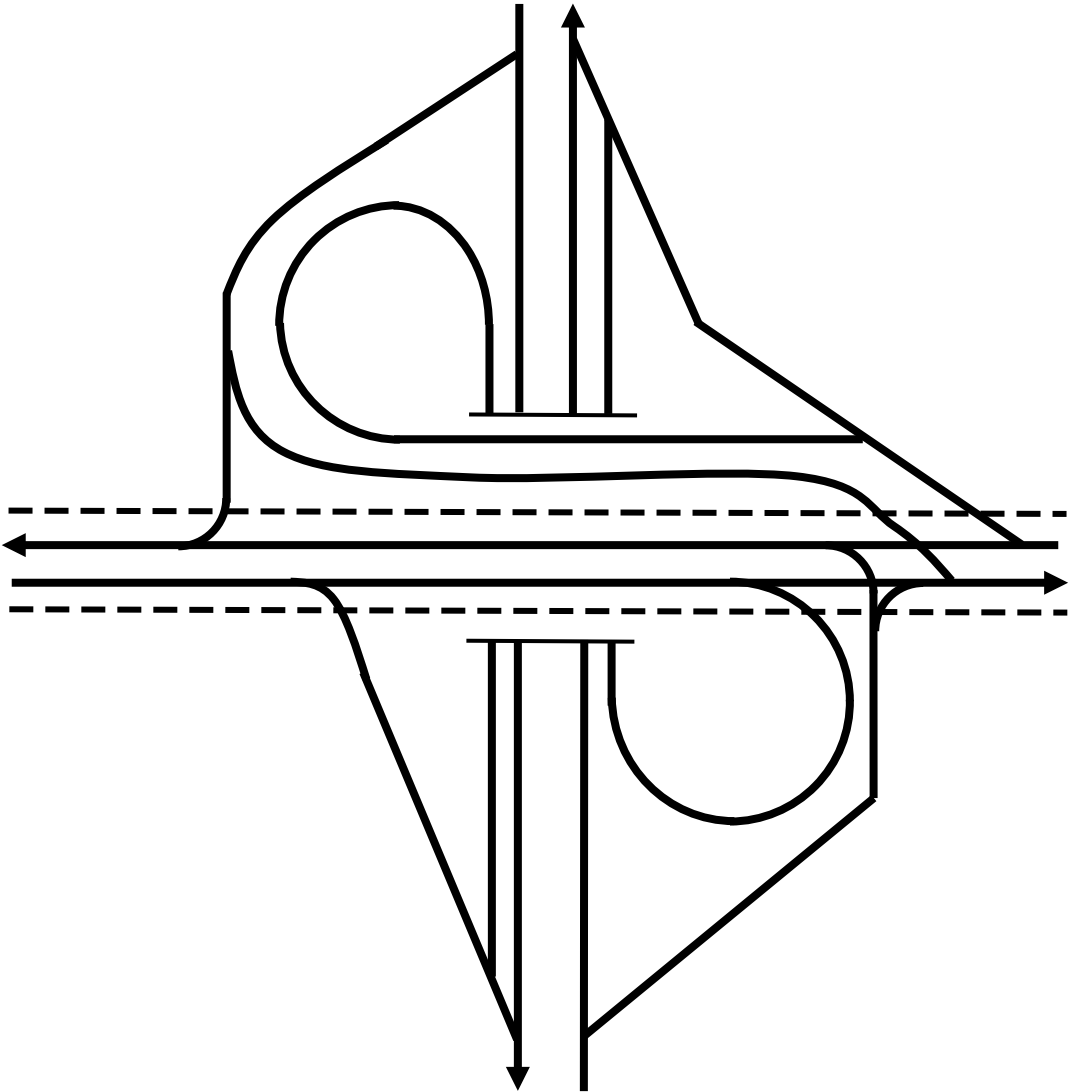
# iiDH, One-Sided Displaced Parclo A

**Summary:** Supplies poor cost scores with lengthy travel distances, a large bridge, and a lengthy extent along the arterial.

**History:** First published by Yu and Wang, 2023.

**Rank:** 108 of 108.

|          |             |                   |                 |                   |                     |                    |             |                   |                      |                       |                    |                |              |               |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
| 3        | 3           | 1                 | 3               | 3                 | 3                   | 1                  | 0           | 1                 | 2                    | 0                     | 7                  | 10             | 3            | 20            |



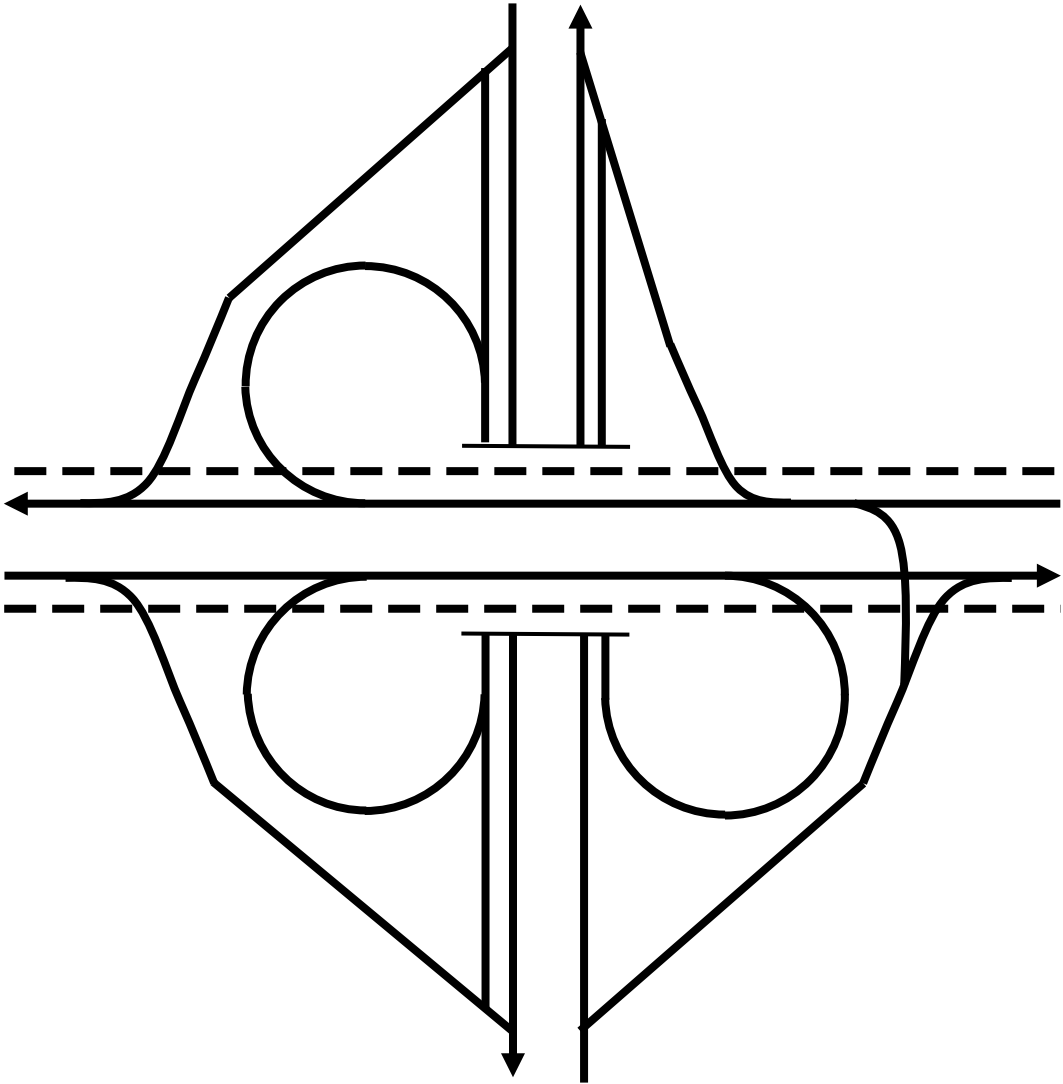
iiDI, Three Loop Missing B

**Summary:** Supplies average performance in efficiency, safety and cost. Requires a small bridge but has lengthy travel distances and poor pedestrian quality.

**History:** This is a rare design, typically created when a loop ramp is removed at a cloverleaf.

**Rank:** 102 of 108.

|          |             |                   |                 |                   |                     |                    |             |                   |                      |                       |                    |                |              |               |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
| 4        | 4           | 0                 | 3               | 3                 | 3                   | 0                  | 5           | 1                 | 2                    | 1                     | 8                  | 9              | 9            | 26            |



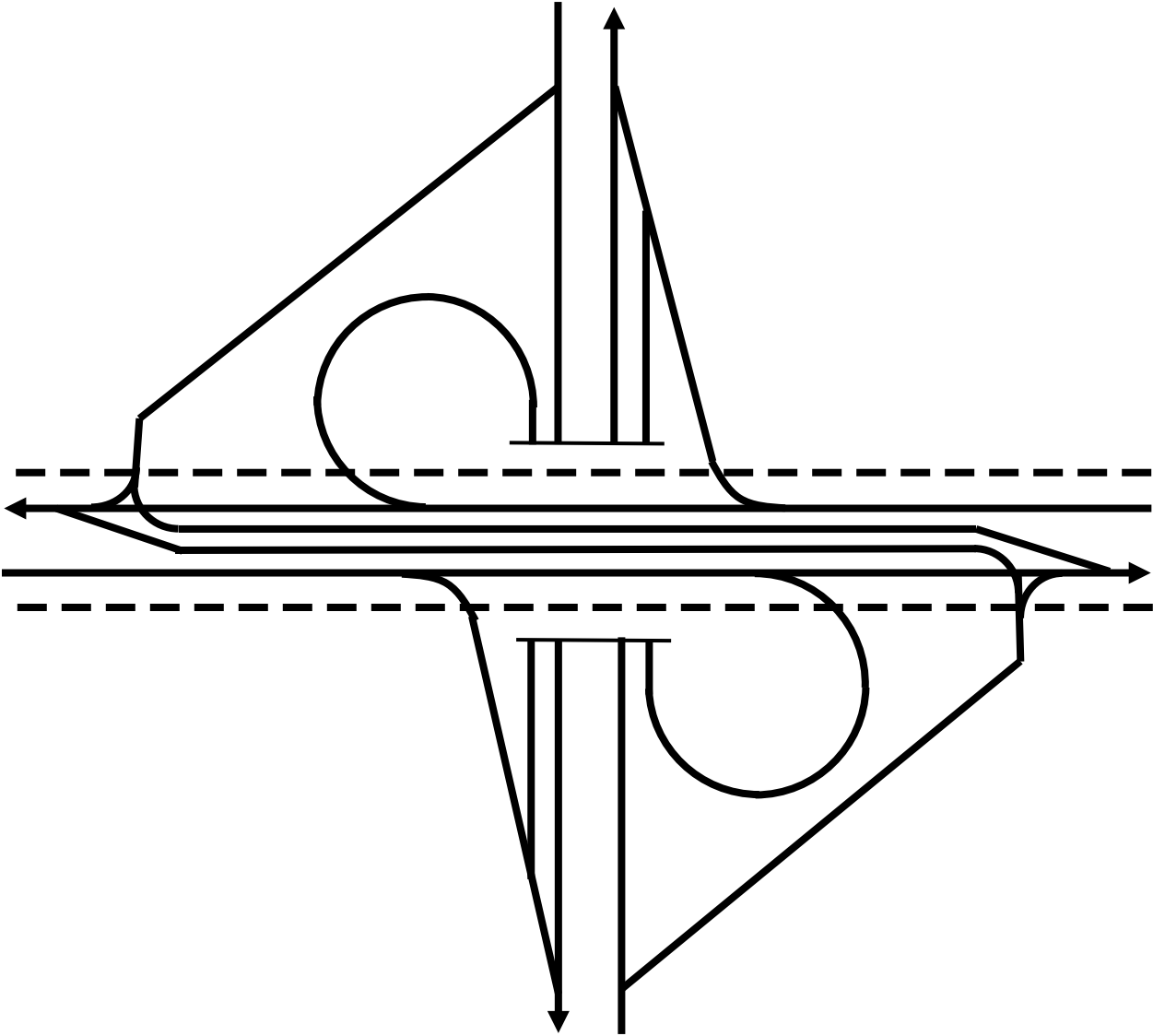
iiGG, Parclo ProgressA

**Summary:** Supplies good efficiency but has poor cost performance. Has great progression, lengthy travel distances, poor pedestrian quality, and requires a large bridge.

**History:** First published by Molan and Hummer, 2021.

**Rank:** 95 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 5           | 1                 | 3               | 3                 | 4                   | 1                  | 1           | 2                 | 2                    | 2                     | 9                  | 11             | 7            | 27            |



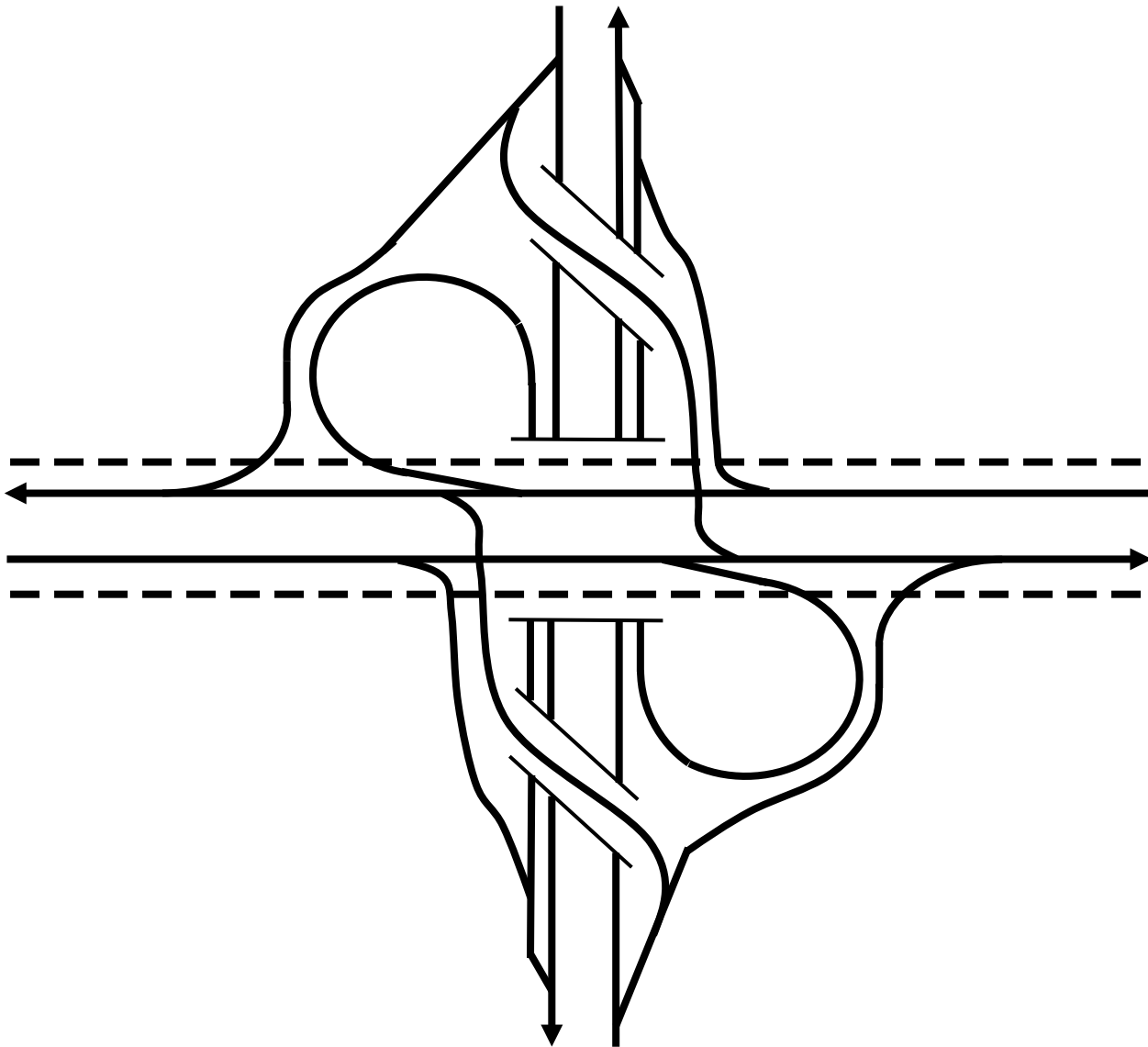
iiHH, Loops Displaced

**Summary:** Supplies good efficiency but has poor cost performance. Has great capacity, requires a large bridge, needs a large right of way, and has a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 101 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 4           | 2                 | 3               | 4                 | 2                   | 2                  | 0           | 1                 | 1                    | 2                     | 11                 | 11             | 4            | 26            |



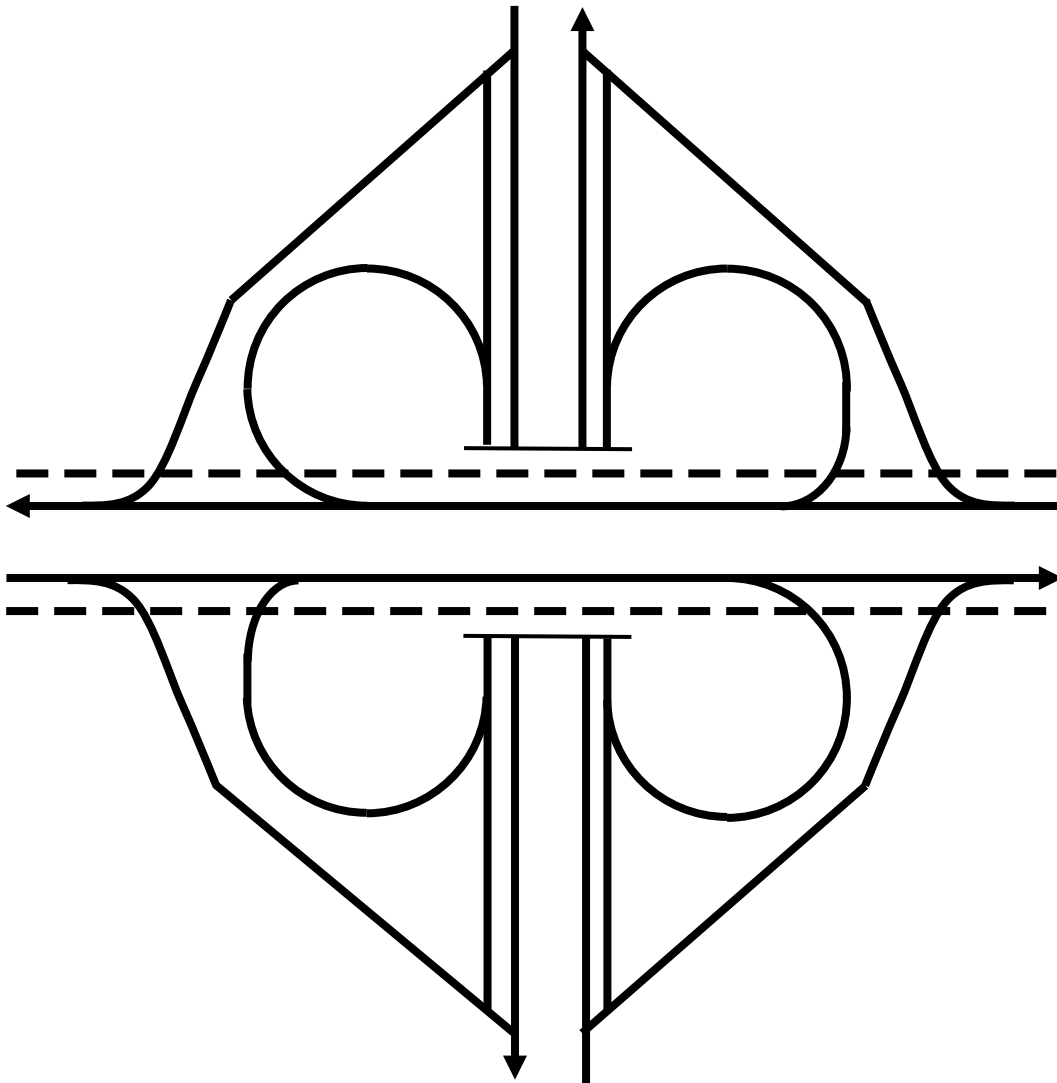
## iii, Cloverleaf

**Summary:** Supplies average efficiency and safety performance but has poor cost scores. Has lengthy travel distances, poor pedestrian quality, a large right of way, and lengthy extents along the freeway and arterial but a small bridge.

**History:** This was the first interchange design. It was patented in 1912 and first constructed in 1928. Subsequently, it became one of the most common interchange designs. The service interchange version is being phased out by some agencies.

**Rank:** 105 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 0                 | 3               | 3                 | 4                   | 0                  | 5           | 0                 | 1                    | 0                     | 9                  | 10             | 6            | 25            |



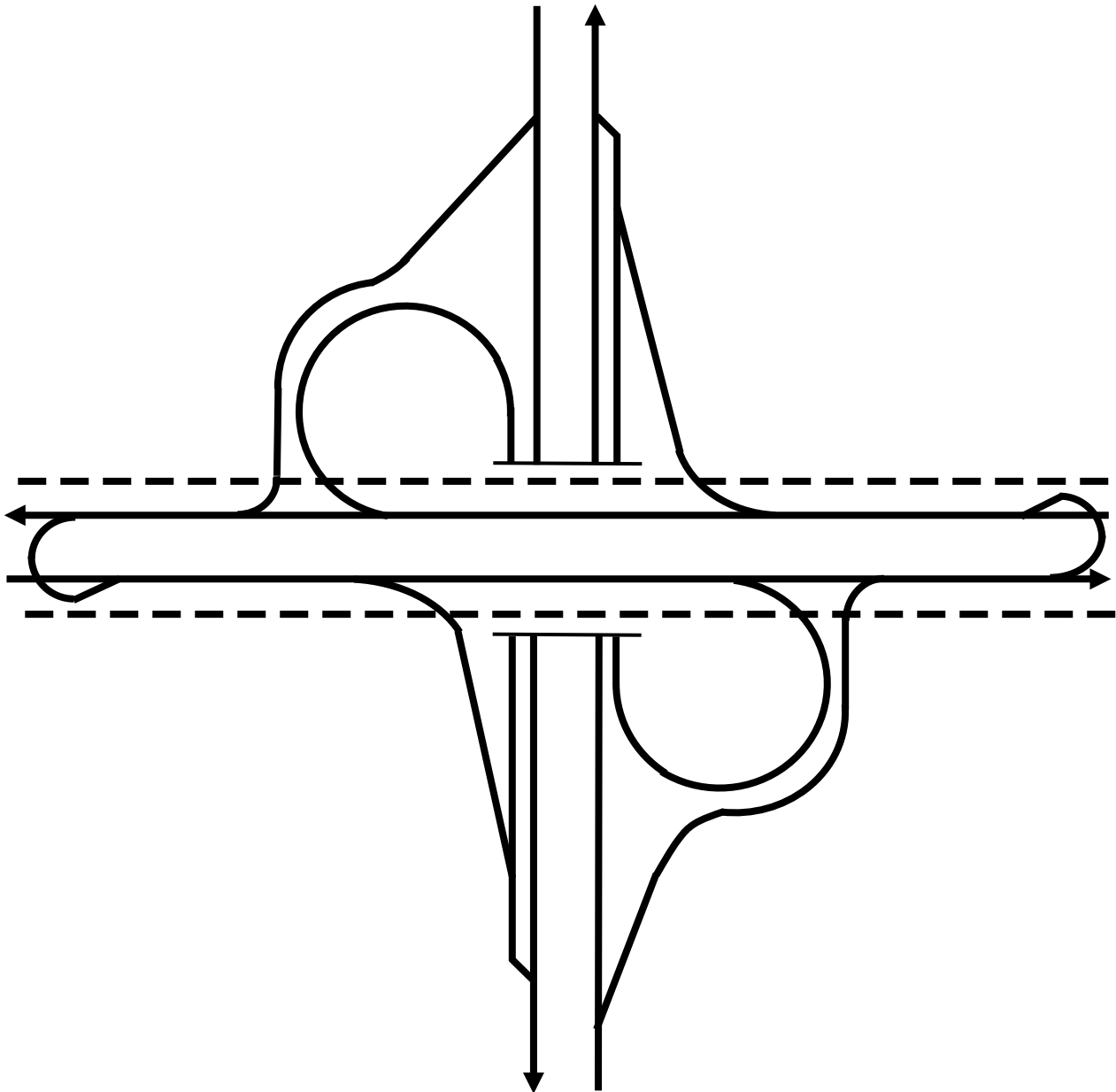
iiJJ, Loop U-Turn on Arterial

**Summary:** Supplies average efficiency, safety, and cost performance. Has good progression and requires a small bridge but also results in extra travel distances, poor pedestrian quality, and a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 92 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 5           | 0                 | 4               | 3                 | 4                   | 1                  | 5           | 2                 | 2                    | 0                     | 7                  | 12             | 9            | 28            |





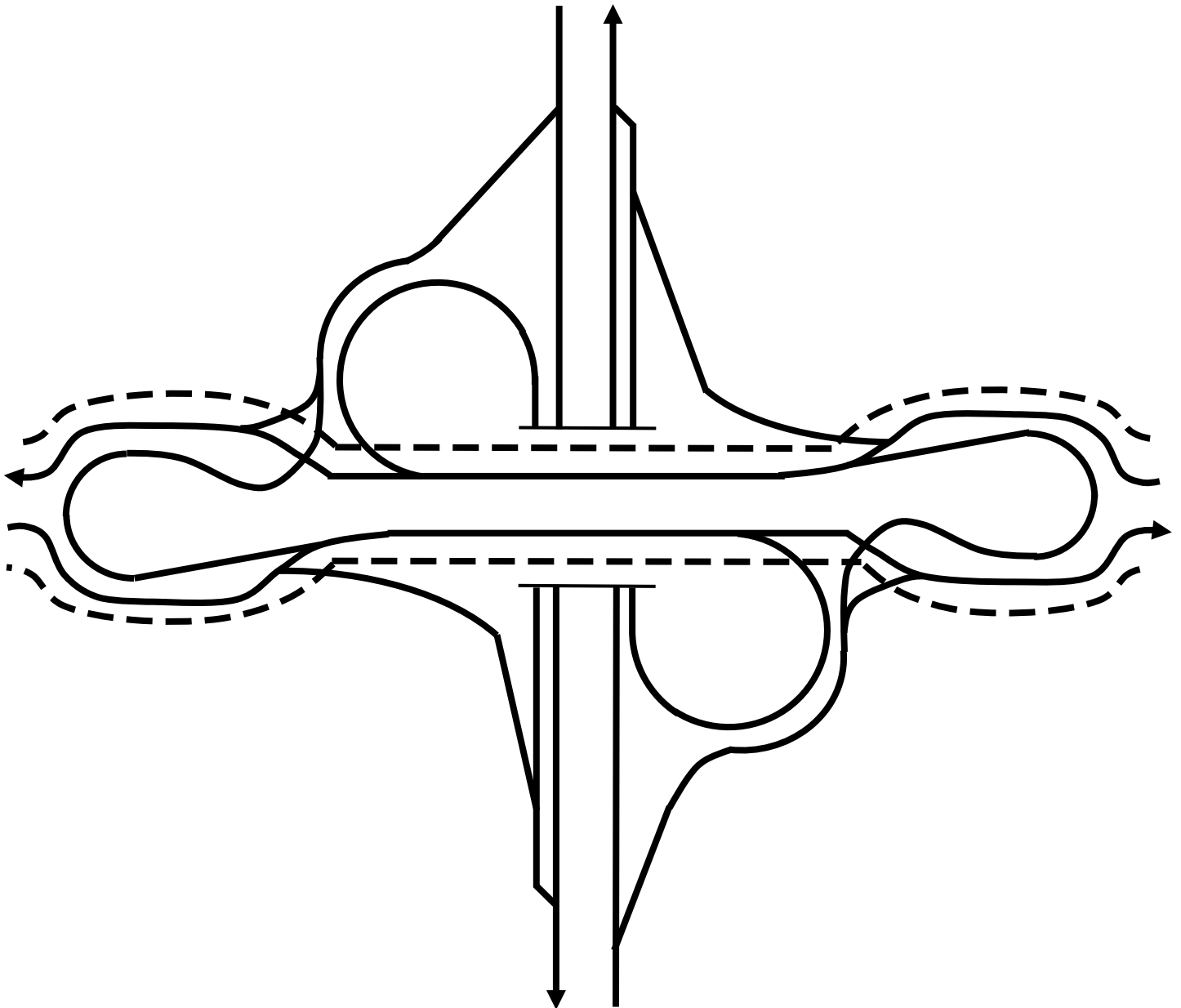
## iiMM, Loop St. Augustine

**Summary:** Supplies average efficiency, safety, and cost performance. Requires a small bridge but has lengthy travel distances, a large right of way, and a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 78 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 0                 | 3               | 3                 | 4                   | 3                  | 5           | 1                 | 2                    | 0                     | 9                  | 13             | 8            | 30            |



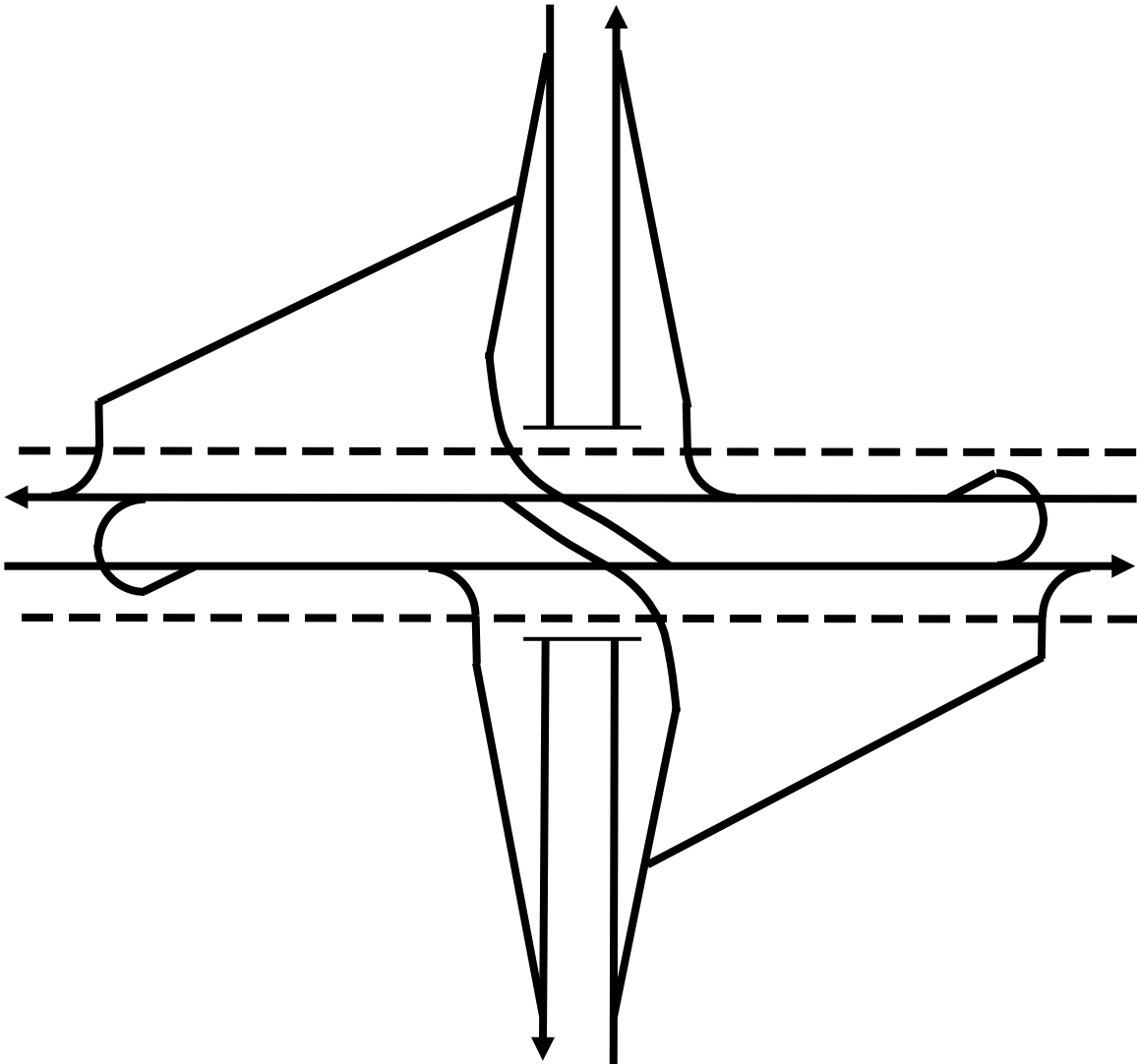
## jjAA, U-Turn on Arterial Single Point

**Summary:** Supplies good efficiency but has poor safety performance. More specifically, this design has good capacity and progression but a high wrong way potential.

**History:** This is a new design.

**Rank:** 87 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 3                 | 3               | 2                 | 1                   | 2                  | 3           | 3                 | 2                    | 2                     | 11                 | 8              | 10           | 29            |



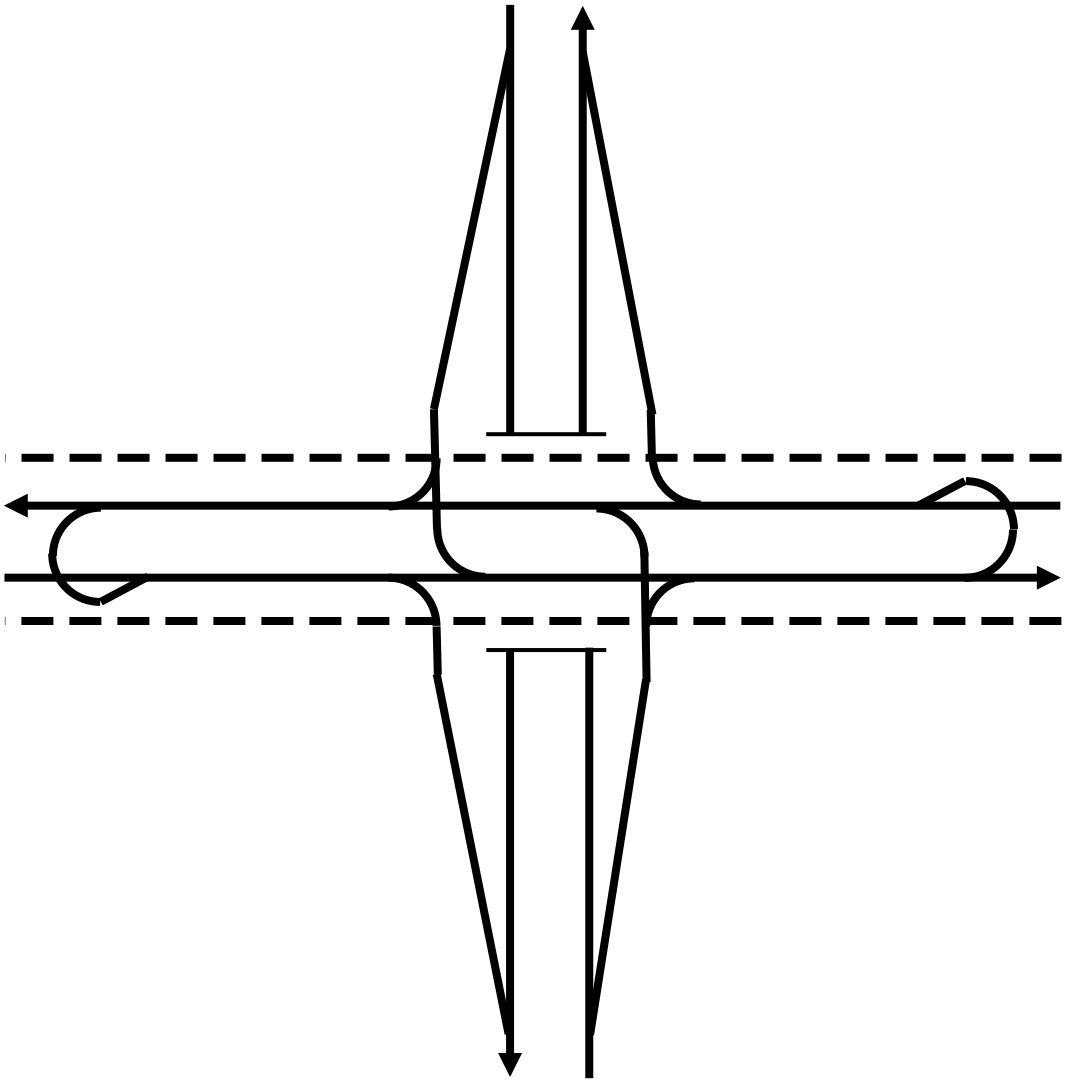
# jjBB, Median U-Turn on Arterial

**Summary:** Supplies good safety performance and great cost scores. The capacity is poor but still a bit higher than a tight diamond so this might be a good competitor in some spots.

**History:** This is a new design.

**Rank:** 5 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 3                 | 3               | 3                 | 3                   | 5                  | 5           | 5                 | 5                    | 4                     | 7                  | 14             | 19           | 40            |



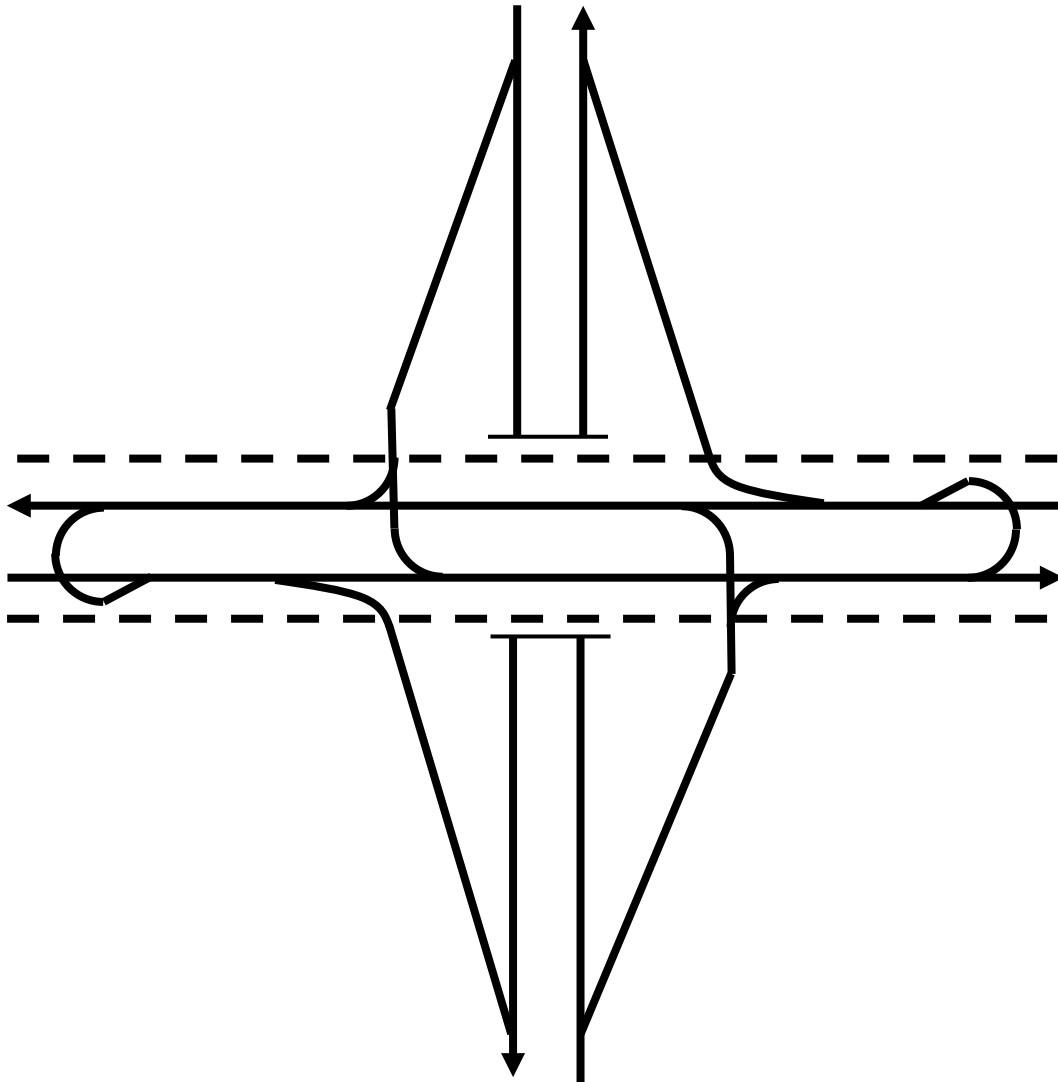
## jjCC, Median U-Turn on Arterial Standard Diamond

**Summary:** Supplies poor efficiency performance but has good cost scores and average safety. Has poor progression but requires a small bridge.

**History:** This is a new design.

**Rank:** 49 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 1           | 2                 | 3               | 4                 | 3                   | 3                  | 5           | 4                 | 4                    | 2                     | 5                  | 13             | 15           | 33            |



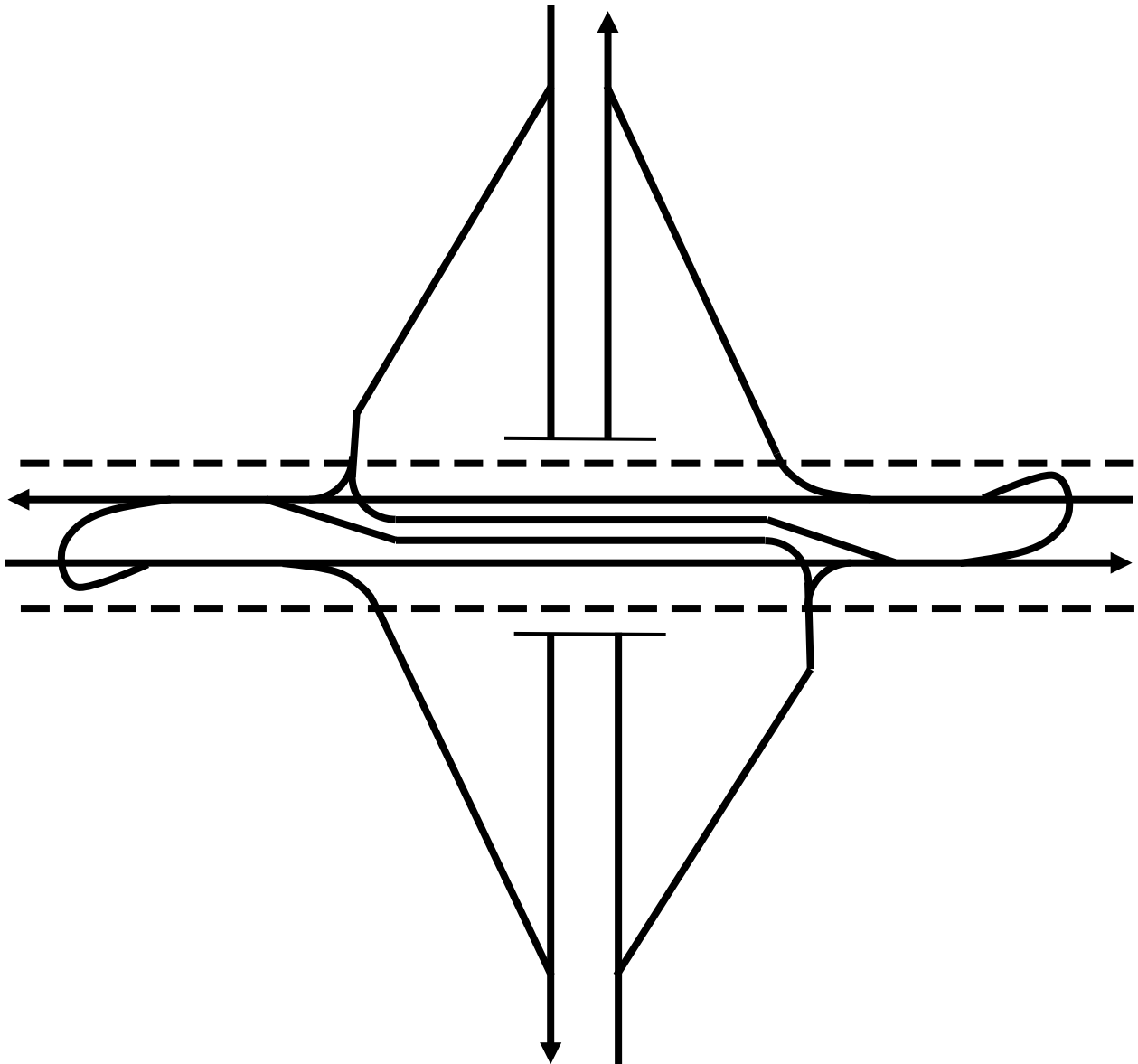
## jjFF, U-Turn on Arterial Standard Contraflow

**Summary:** Supplies average efficiency, cost, and safety performance. Has poor capacity but great progression.

**History:** This is a new design.

**Rank:** 56 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 5           | 2                 | 3               | 3                 | 4                   | 3                  | 2           | 4                 | 4                    | 1                     | 8                  | 13             | 11           | 32            |



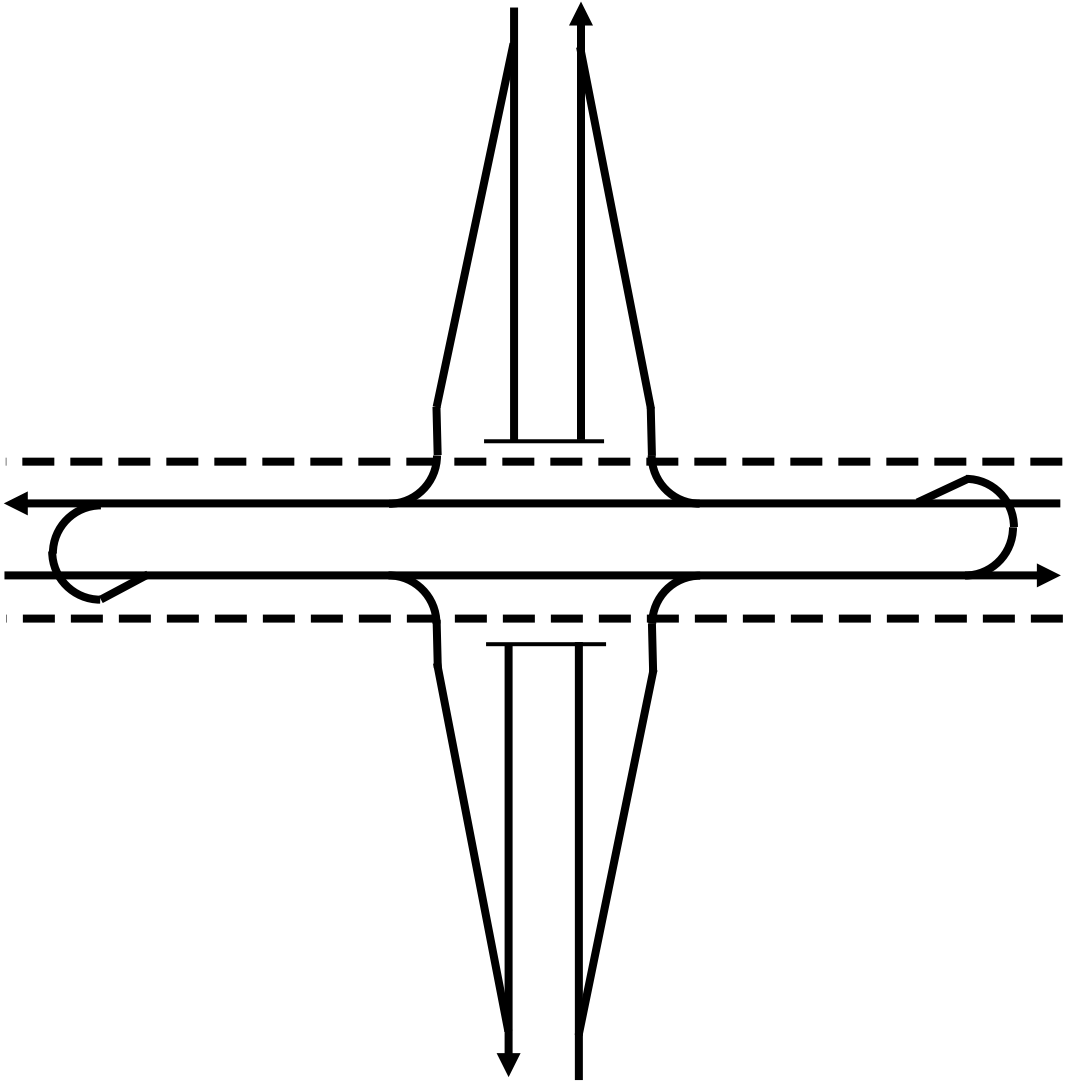
# jjjJ, Signalized FRE

**Summary:** Supplies poor efficiency, good safety, and great cost performance. Has a low number of conflict points, small bridge size, and a small right of way. Where there is low demand and no space for roundabouts this concept may be competitive.

**History:** First published by Berry and Click, 2011.

**Rank:** 9 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 0        | 5           | 1                 | 5               | 2                 | 4                   | 3                  | 5           | 5                 | 5                    | 4                     | 6                  | 14             | 19           | 39            |



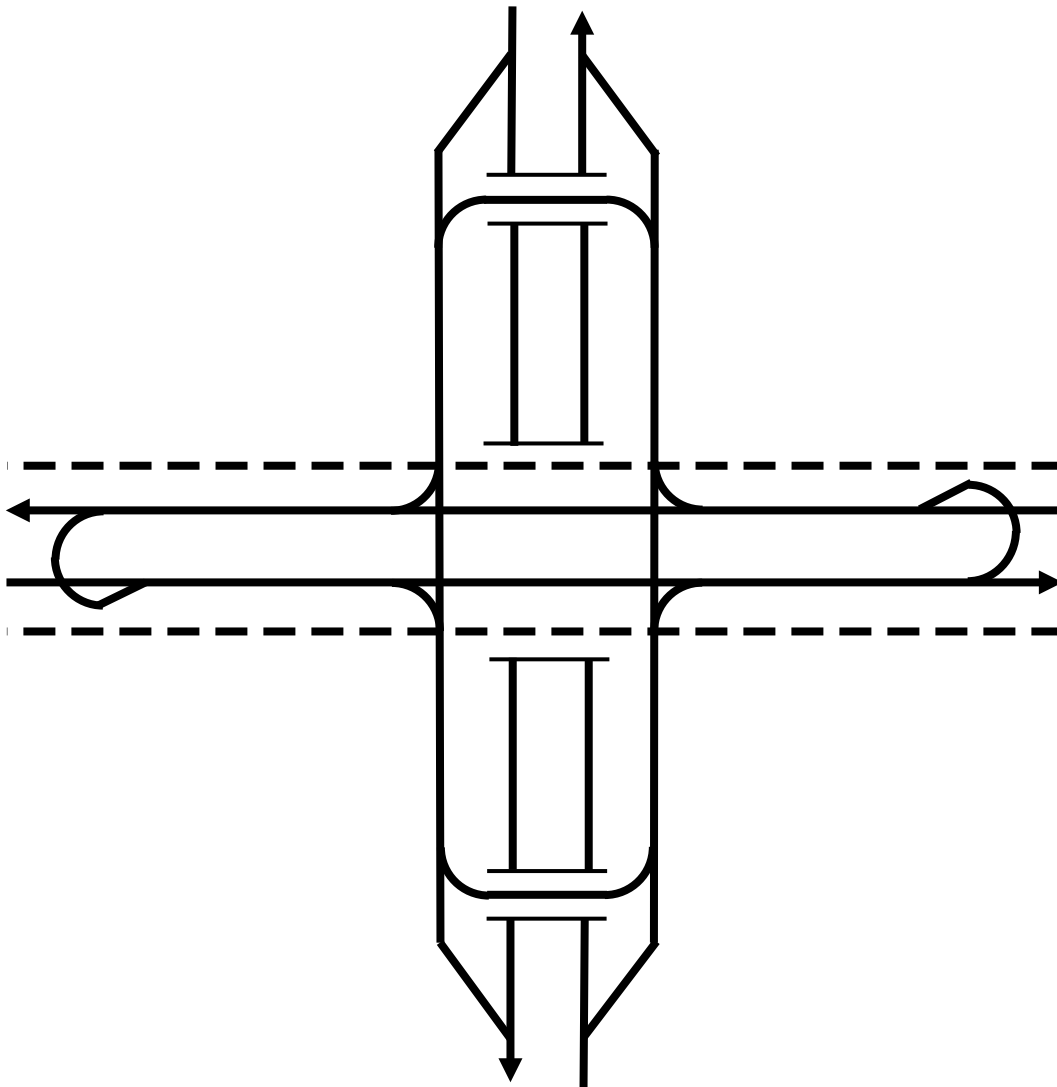
## jjKK U-Turn on Arterial U-Turn over Freeway

**Summary:** Supplies average efficiency, safety, and cost performance. Requires lengthy travel distances, has a large number of conflict points and unusual maneuvers, and has a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 73 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 1                 | 1               | 1                 | 3                   | 4                  | 4           | 4                 | 1                    | 4                     | 9                  | 9              | 13           | 31            |



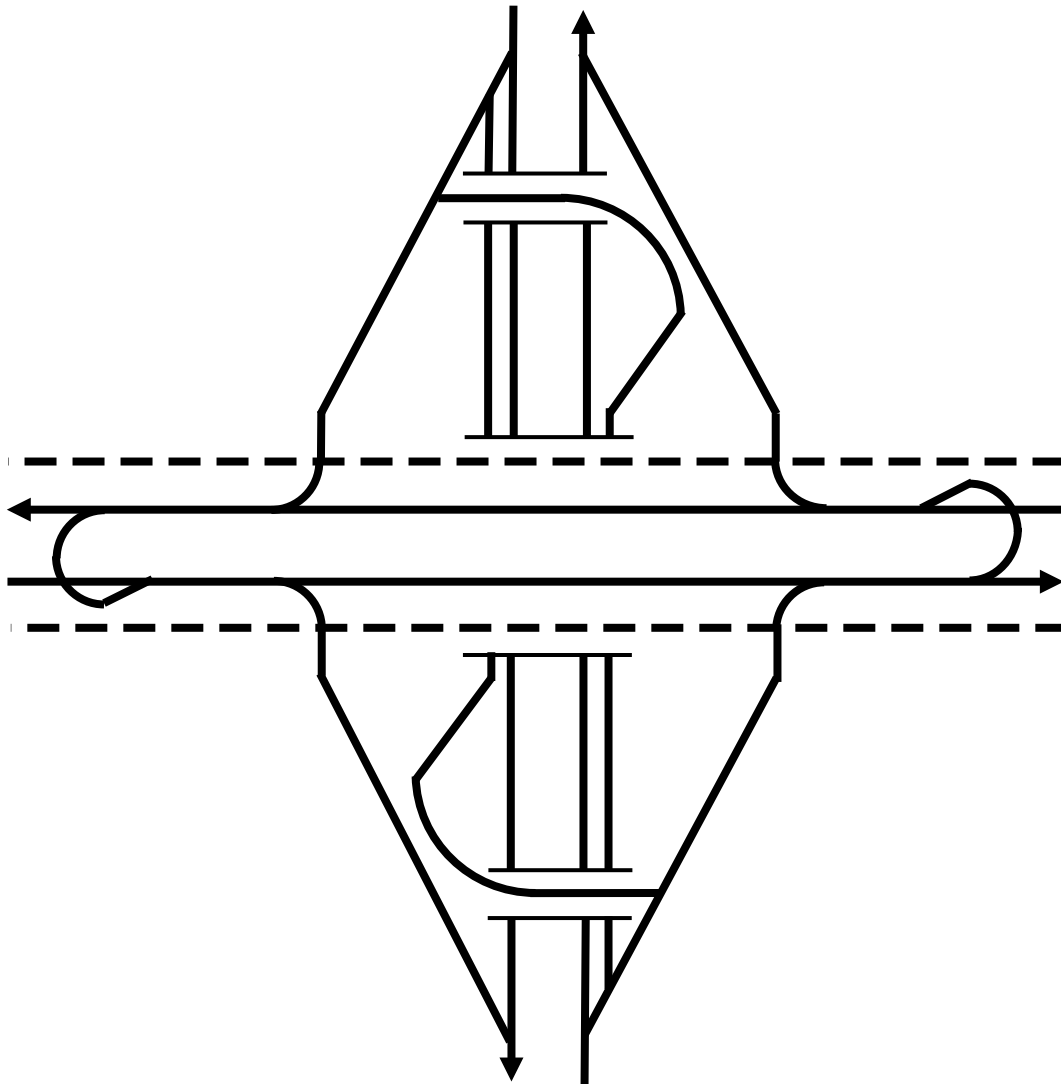
## jjLL, U-Turn on Arterial U-Turn over Freeway with Slips

**Summary:** Provides good safety and poor cost performance. Requires lengthy travel distances, a large right of way, and lengthy extents along the freeway and the arterial.

**History:** This is a new design.

**Rank:** 75 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 0                 | 4               | 4                 | 4                   | 3                  | 3           | 0                 | 1                    | 2                     | 9                  | 15             | 6            | 30            |





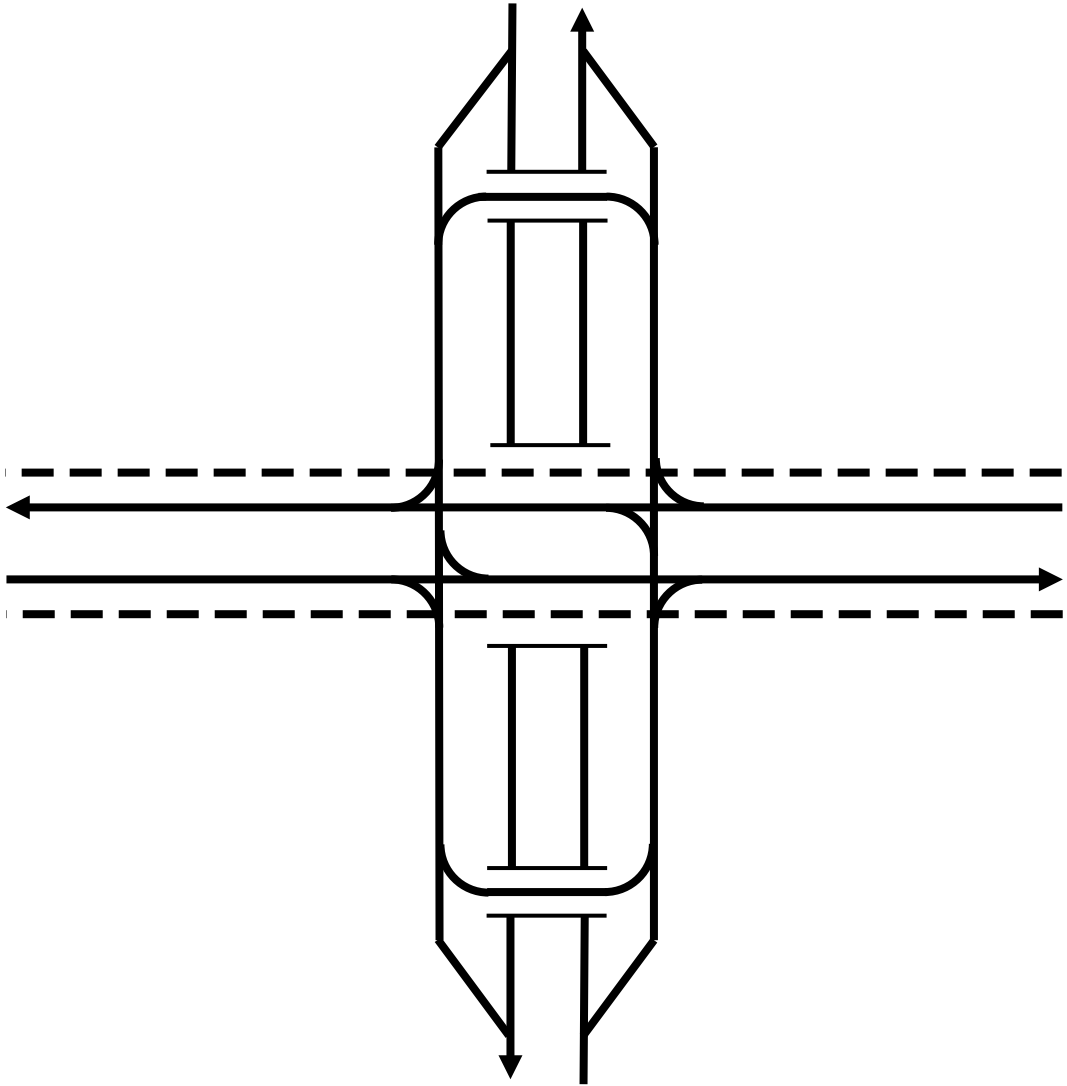
# kkBB, Median U-Turn

**Summary:** Provides good cost scores with average efficiency and safety performance. Has a high number of conflict points and a lengthy extent along the freeway but has great pedestrian quality and short extents along the arterial.

**History:** Introduced in the 1960s in Michigan, the design remains popular there.

**Rank:** 28 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 3           | 3                 | 1               | 3                 | 3                   | 5                  | 4           | 4                 | 1                    | 5                     | 9                  | 12             | 14           | 35            |



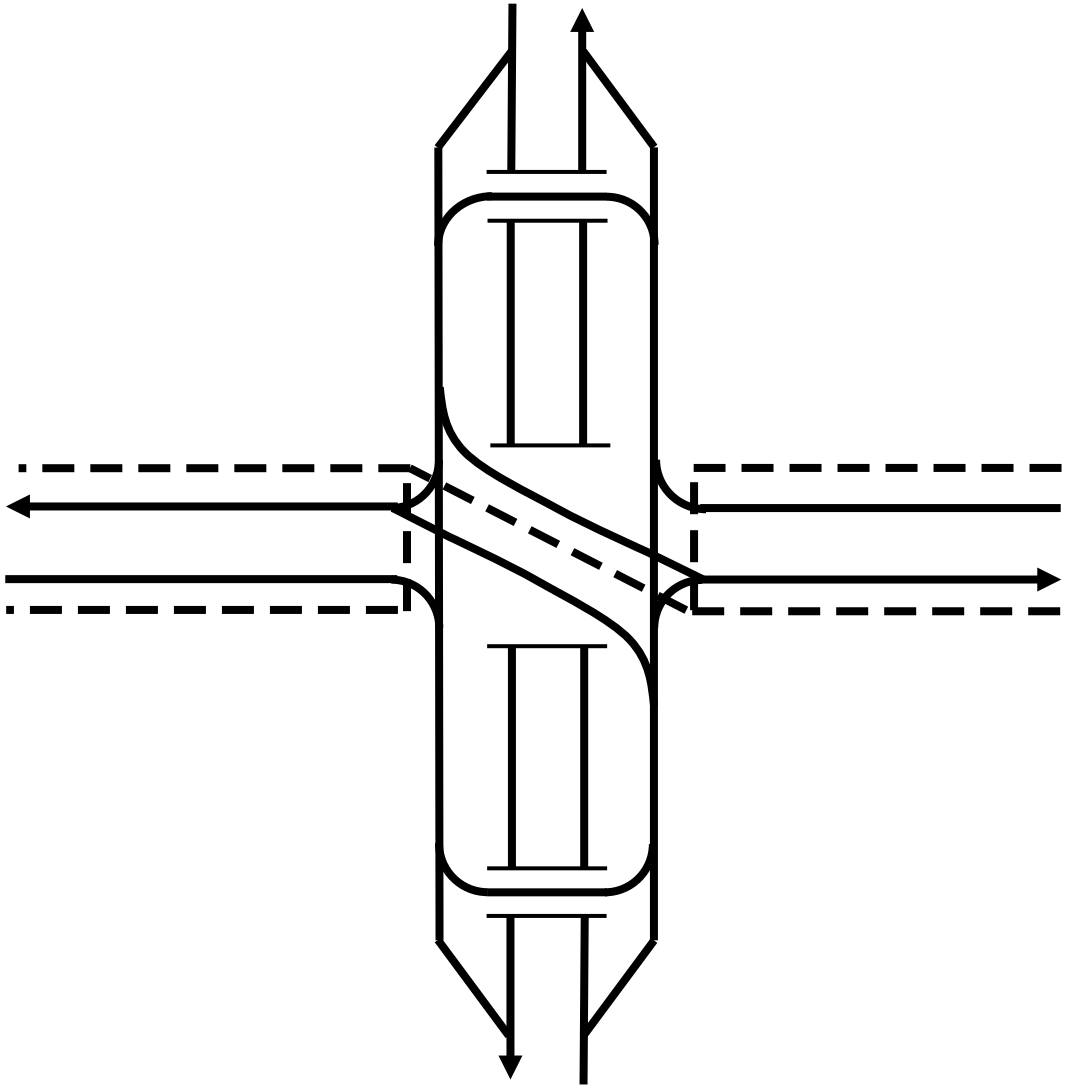
# kkBB, RCI over Freeway

**Summary:** Supplies good safety benefits with great progression and short extents along the arterial.  
Requires lengthy travel distances and extents along the freeway.

**History:** This is a new design.

**Rank:** 26 of 108.

|          |             |                   |                 |                   |                     |                    |             |                   |                      |                       |                    |                |              |               |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
| 2        | 5           | 1                 | 3               | 4                 | 4                   | 3                  | 3           | 4                 | 1                    | 5                     | 8                  | 14             | 13           | 35            |



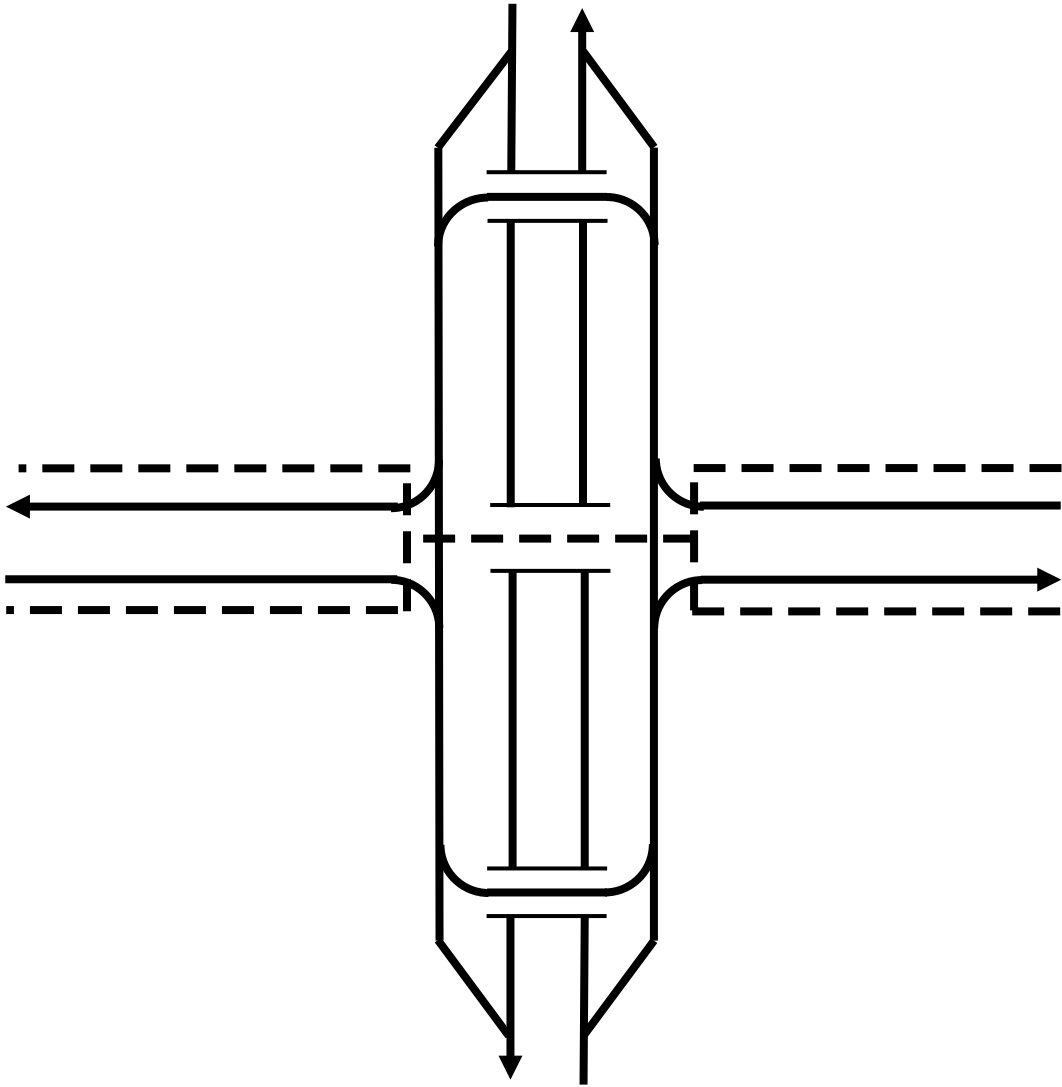
kkKK, ILAC over Freeway

**Summary:** Supplies poor efficiency but good safety and cost scores with a small bridge size.

**History:** This is a new design.

**Rank:** 30 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 0        | 5           | 0                 | 5               | 3                 | 4                   | 2                  | 5           | 4                 | 1                    | 5                     | 5                  | 14             | 15           | 34            |



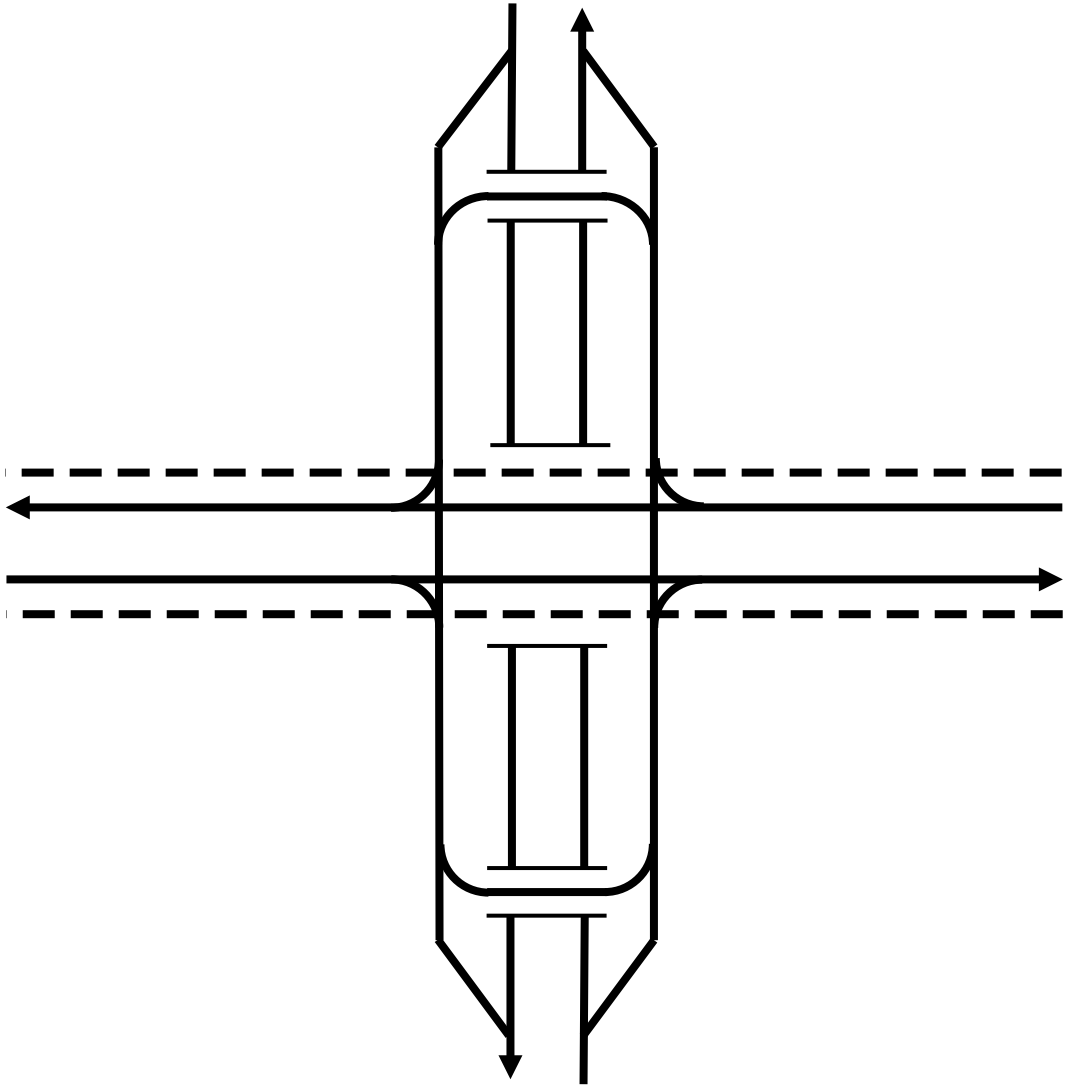
# kkKK, U-Turn over Freeway

**Summary:** Supplies good cost scores with average efficiency and safety performance. Requires lengthy travel distances, a high number of unusual maneuvers, and a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 63 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 1                 | 2               | 0                 | 3                   | 4                  | 4           | 4                 | 1                    | 5                     | 9                  | 9              | 14           | 32            |



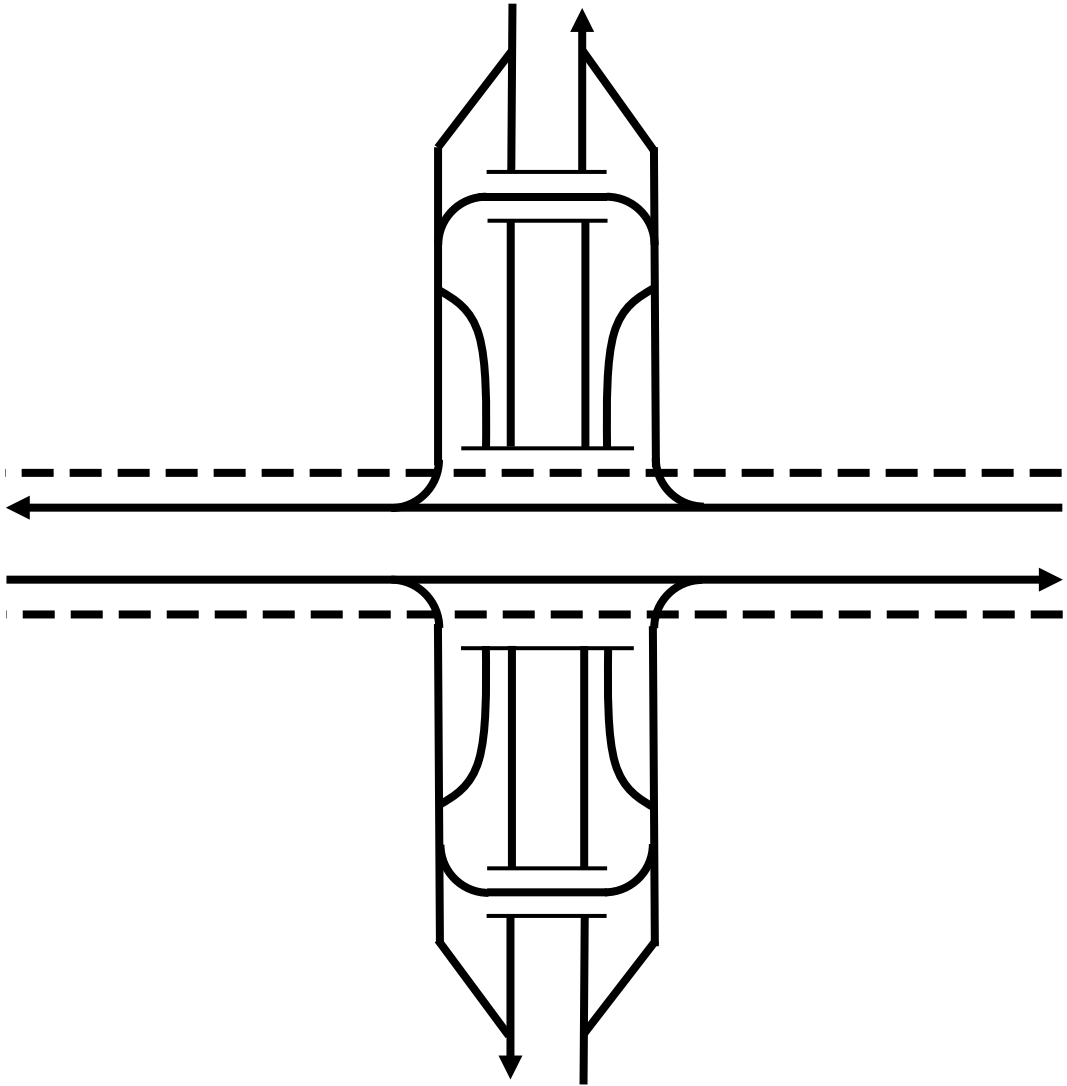
# kkKK, Hourglass

**Summary:** Supplies good efficiency but poor cost performance. Requires lengthy travel distances, a large bridge, and a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 66 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 1                 | 4               | 2                 | 4                   | 3                  | 0           | 3                 | 0                    | 4                     | 11                 | 13             | 7            | 31            |



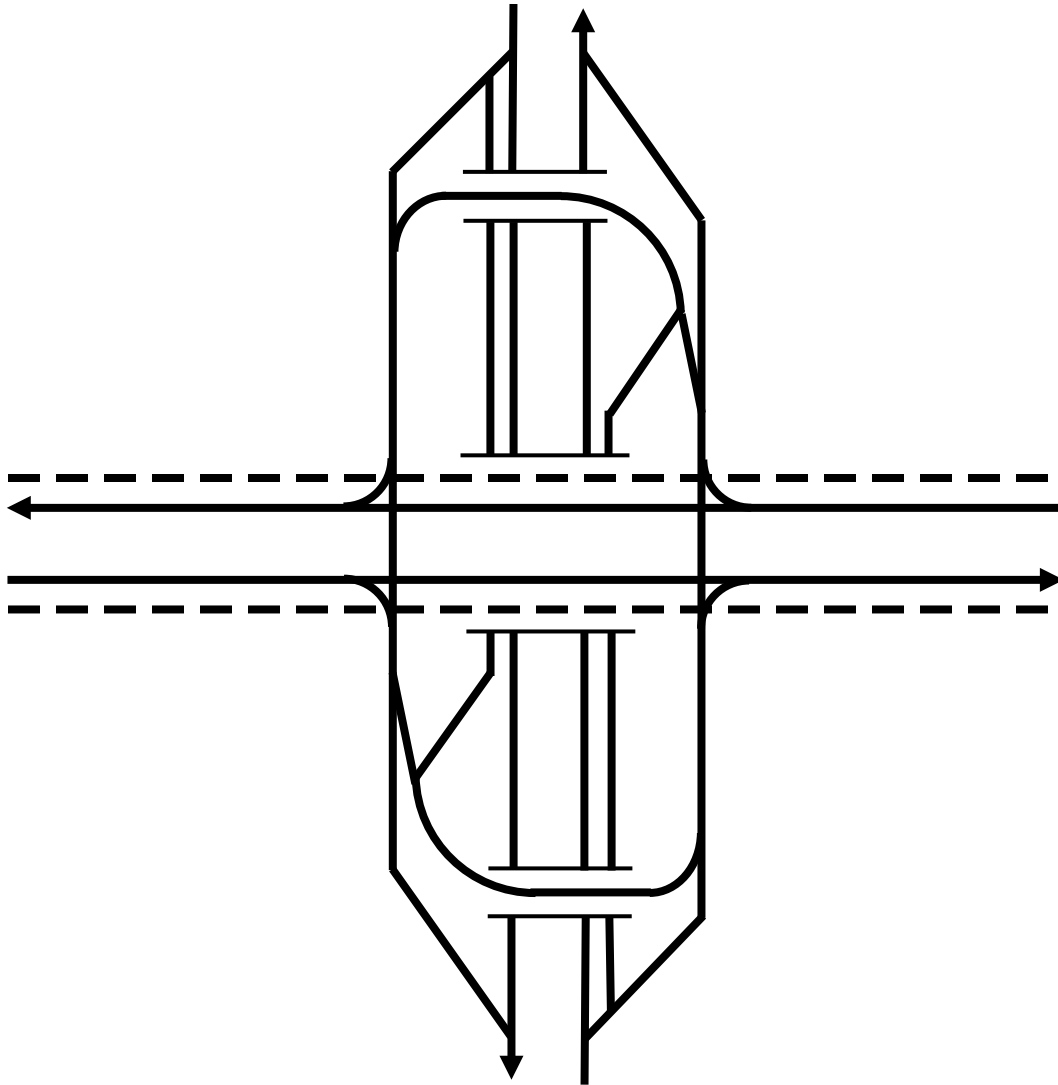
## kkLL, U-Turn over Freeway U-Turn over Freeway with Slip Ramp

**Summary:** Supplies poor cost scores and average efficiency and safety performance. Requires lengthy travel distances, has a large number of conflict points, has a large right of way, and needs a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 98 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 4           | 1                 | 1               | 2                 | 3                   | 4                  | 3           | 1                 | 0                    | 3                     | 10                 | 10             | 7            | 27            |



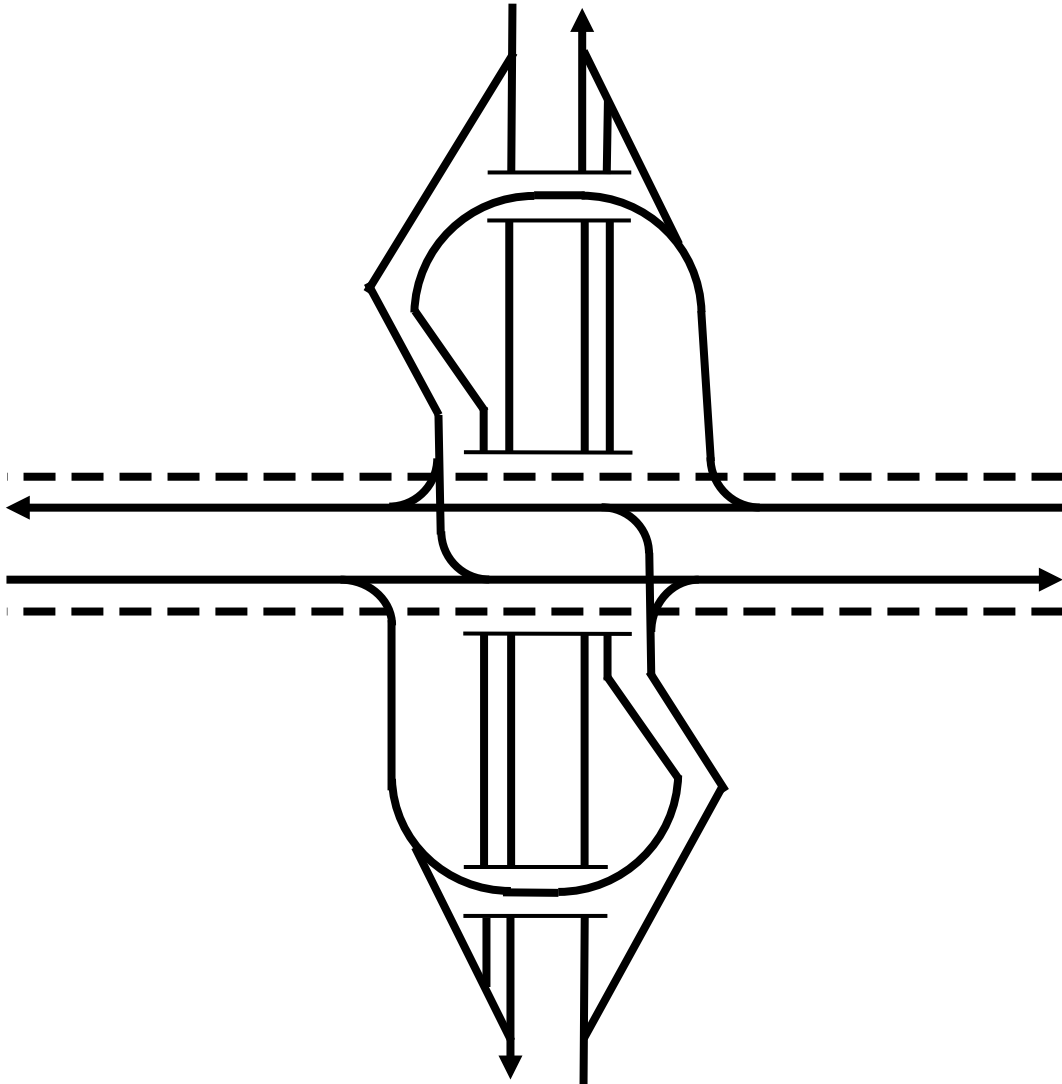
## II BB, U-Turn over Freeway with Slip Ramp Tight Diamond

**Summary:** Provides good safety but poor cost scores. Requires a large right of way and lengthy extents along the freeway.

**History:** This is a new design.

**Rank:** 70 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 3           | 3                 | 3               | 3                 | 3                   | 5                  | 3           | 1                 | 1                    | 3                     | 9                  | 14             | 8            | 31            |



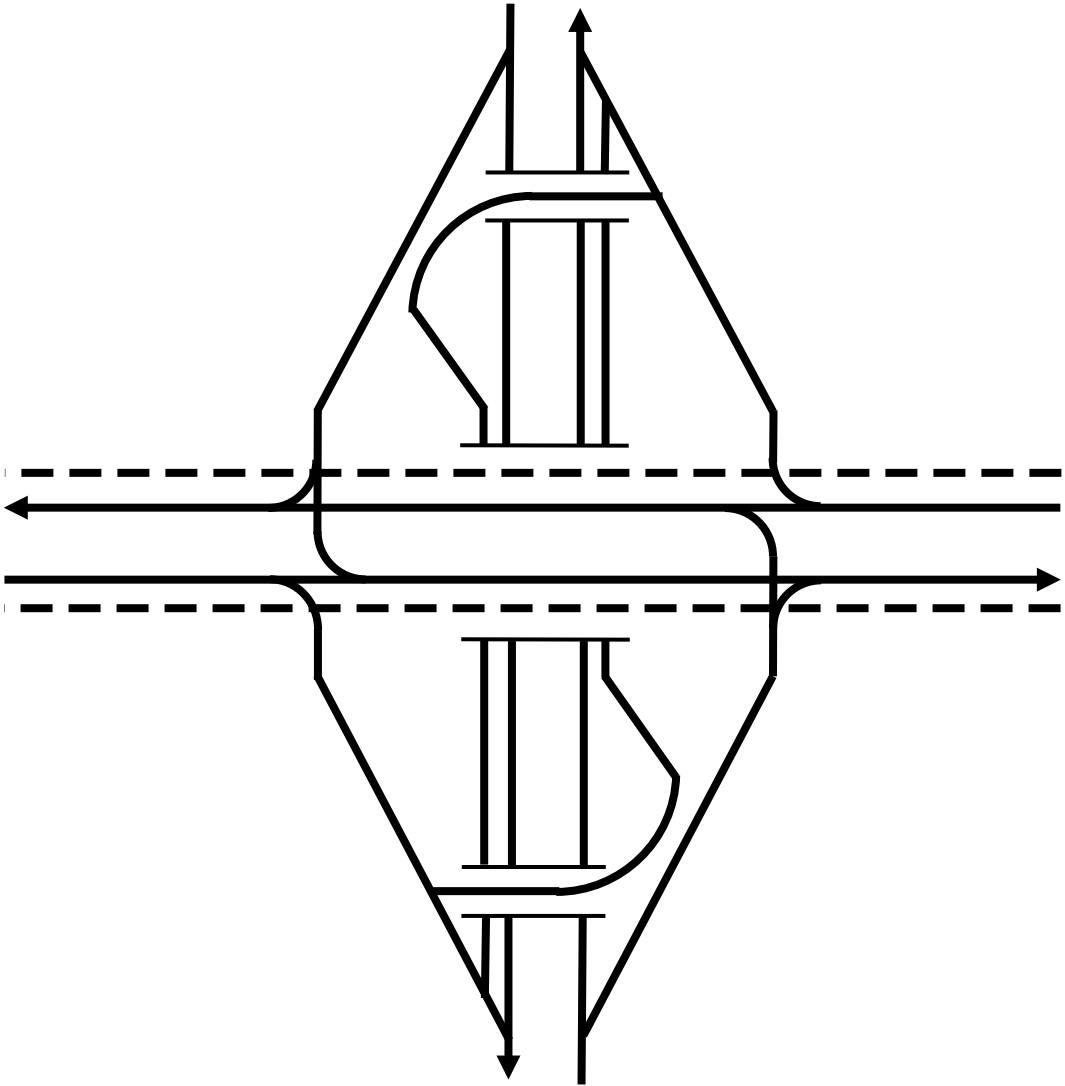
# IIICC, Milwaukee A

**Summary:** Provides poor cost scores and average efficiency and safety performance. Has poor progression, requires a large right of way, and has a lengthy extent along the arterial.

**History:** A Milwaukee A interchange exists at I-894 and 27<sup>th</sup> Street in Milwaukee, Wisconsin.

**Rank:** 100 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 1           | 2                 | 3               | 4                 | 3                   | 3                  | 3           | 0                 | 1                    | 3                     | 7                  | 13             | 7            | 27            |





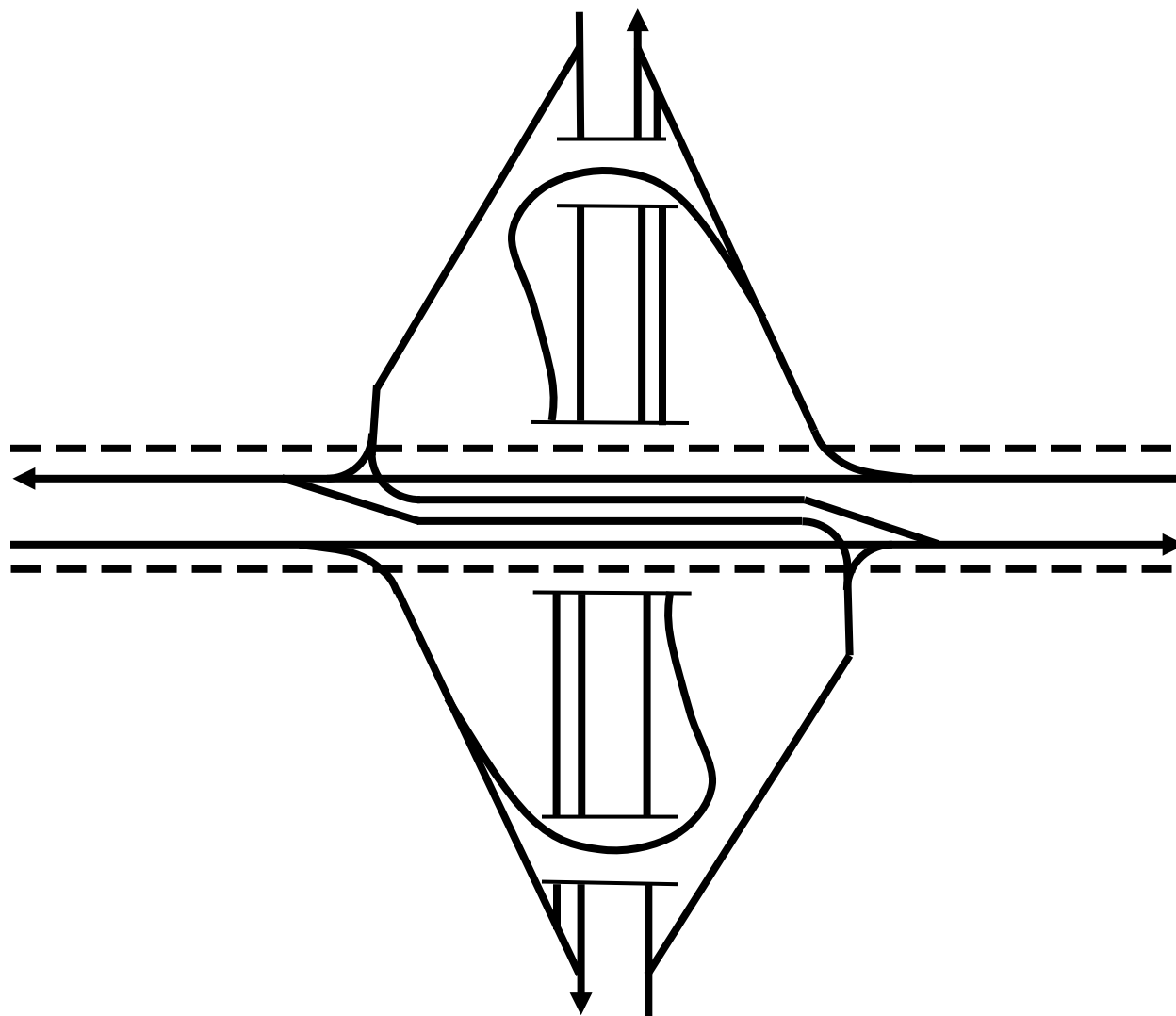
## IIFF, U-Turn over Freeway with Slip Ramp Standard Contraflow

**Summary:** Supplies average efficiency, safety, and cost performance. Has great progression but requires a large right of way.

**History:** This is a new design.

**Rank:** 68 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 5           | 2                 | 3               | 3                 | 4                   | 3                  | 3           | 0                 | 2                    | 3                     | 10                 | 13             | 8            | 31            |



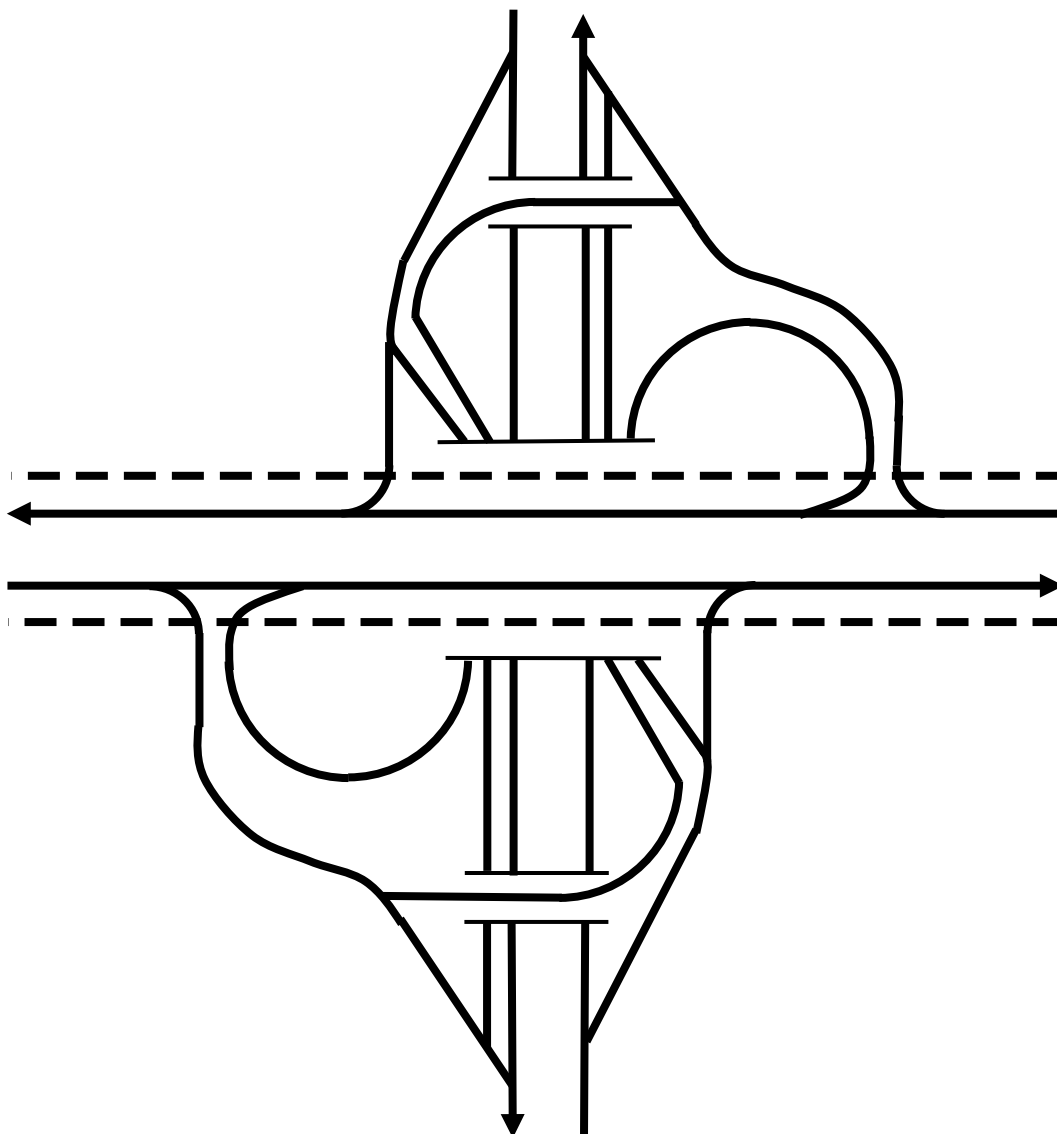
### III, U-Turn over Freeway with Slip Ramp Loops

**Summary:** Provides good safety performance but poor cost scores. Has great progression and capacity but requires lengthy travel distances.

**History:** This concept is in operation at I-41 and Watertown Plank Road in Milwaukee, WI.

**Rank:** 96 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 0                 | 4               | 4                 | 3                   | 4                  | 1           | 0                 | 0                    | 2                     | 9                  | 15             | 3            | 27            |



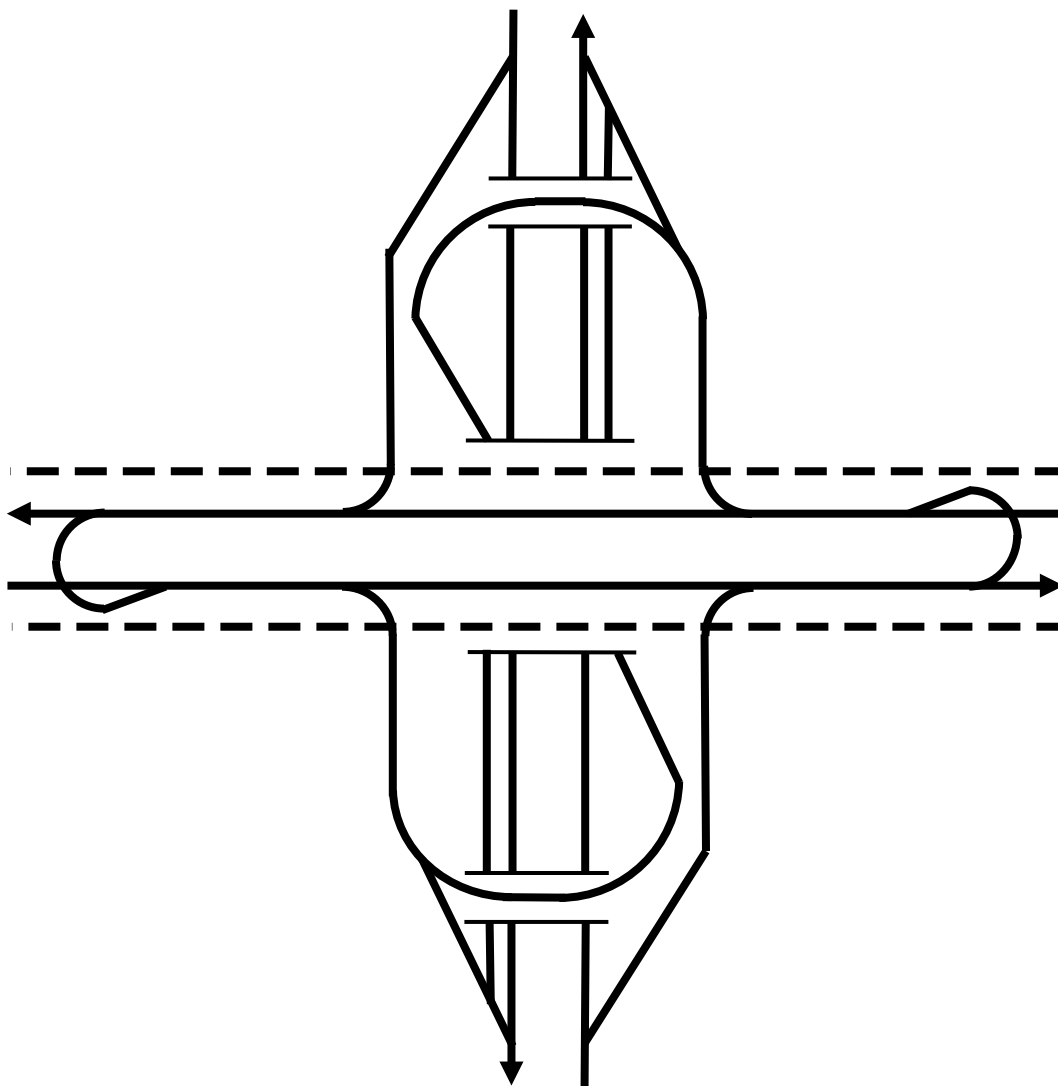
## IIJJ, U-Turn over Freeway with Slip Ramp U-Turn on Arterial

**Summary:** Provides good safety performance but poor cost scores. Requires lengthy travel distances, a large right of way, and lengthy extents along the freeway and the arterial.

**History:** This is a new design.

**Rank:** 82 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 0                 | 4               | 3                 | 4                   | 3                  | 3           | 0                 | 1                    | 2                     | 9                  | 14             | 6            | 29            |



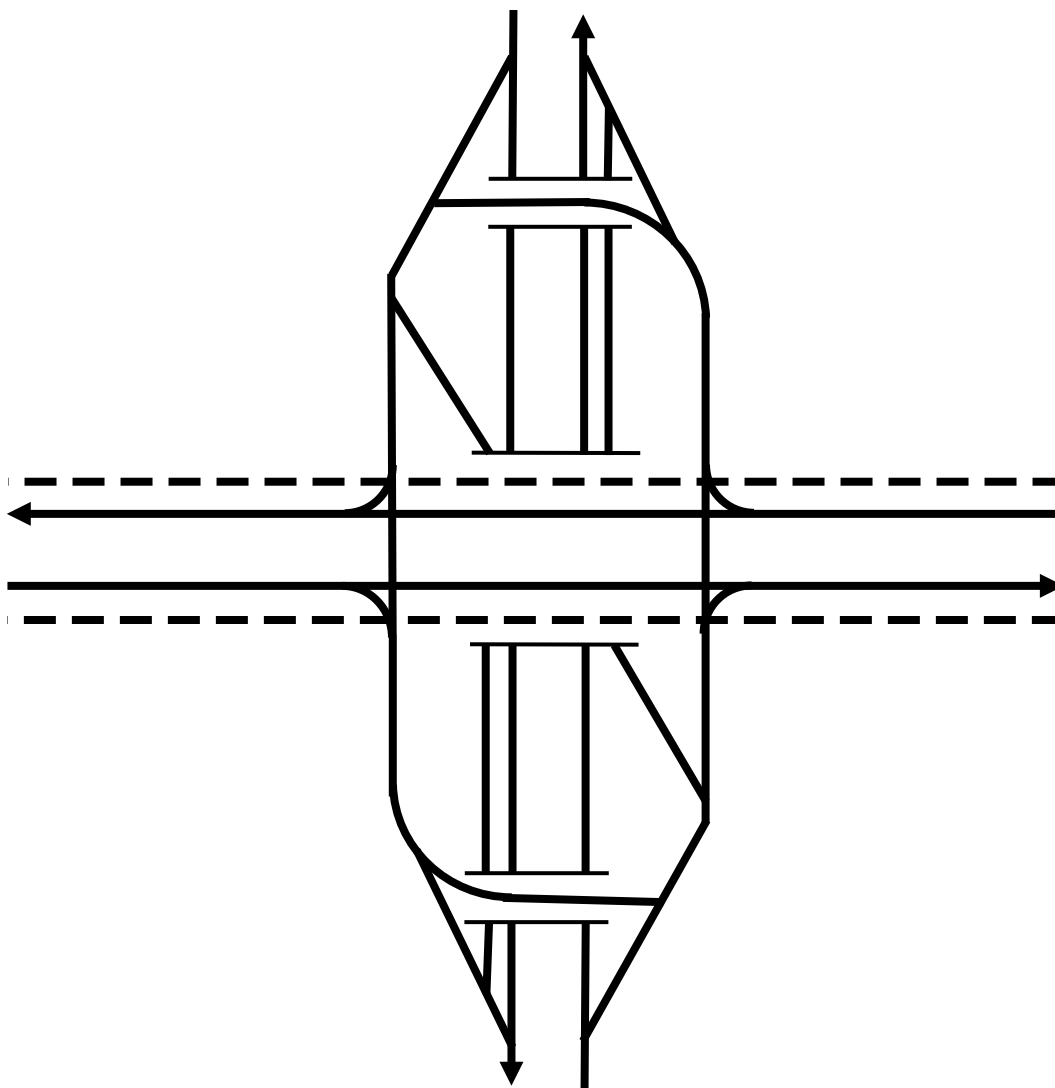
## IKKK, U-Turn over Freeway with Slip Ramp U-Turn over Freeway

**Summary:** Provides poor safety and cost scores. Has great capacity but requires lengthy travel distances, a high number of unusual maneuvers, large right of way, and a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 104 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 4           | 1                 | 1               | 0                 | 3                   | 4                  | 3           | 1                 | 0                    | 3                     | 10                 | 8              | 7            | 25            |



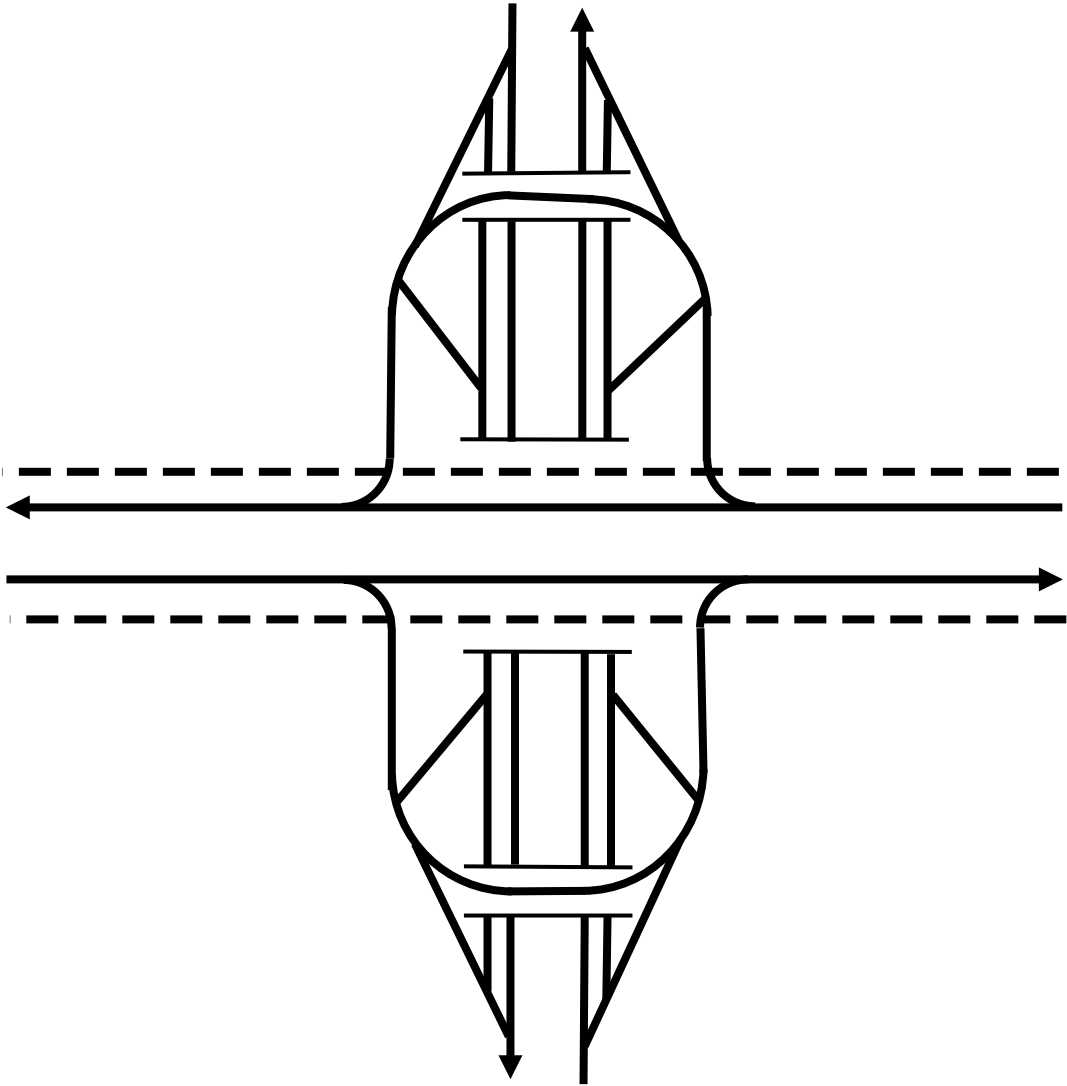
IILL, W

**Summary:** Supplies good efficiency but with poor cost performance. Requires lengthy travel distances, has a high number of unusual maneuvers, has a large right of way, and has a lengthy extent along the freeway.

**History:** First published by Thompson et. al., 2003.

**Rank:** 103 of 108.

|          |             |                   |                 |                   |                     |                    |             |                   |                      |                       |                    |                |              |               |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
| 5        | 5           | 1                 | 2               | 0                 | 4                   | 3                  | 3           | 0                 | 0                    | 3                     | 11                 | 9              | 6            | 26            |



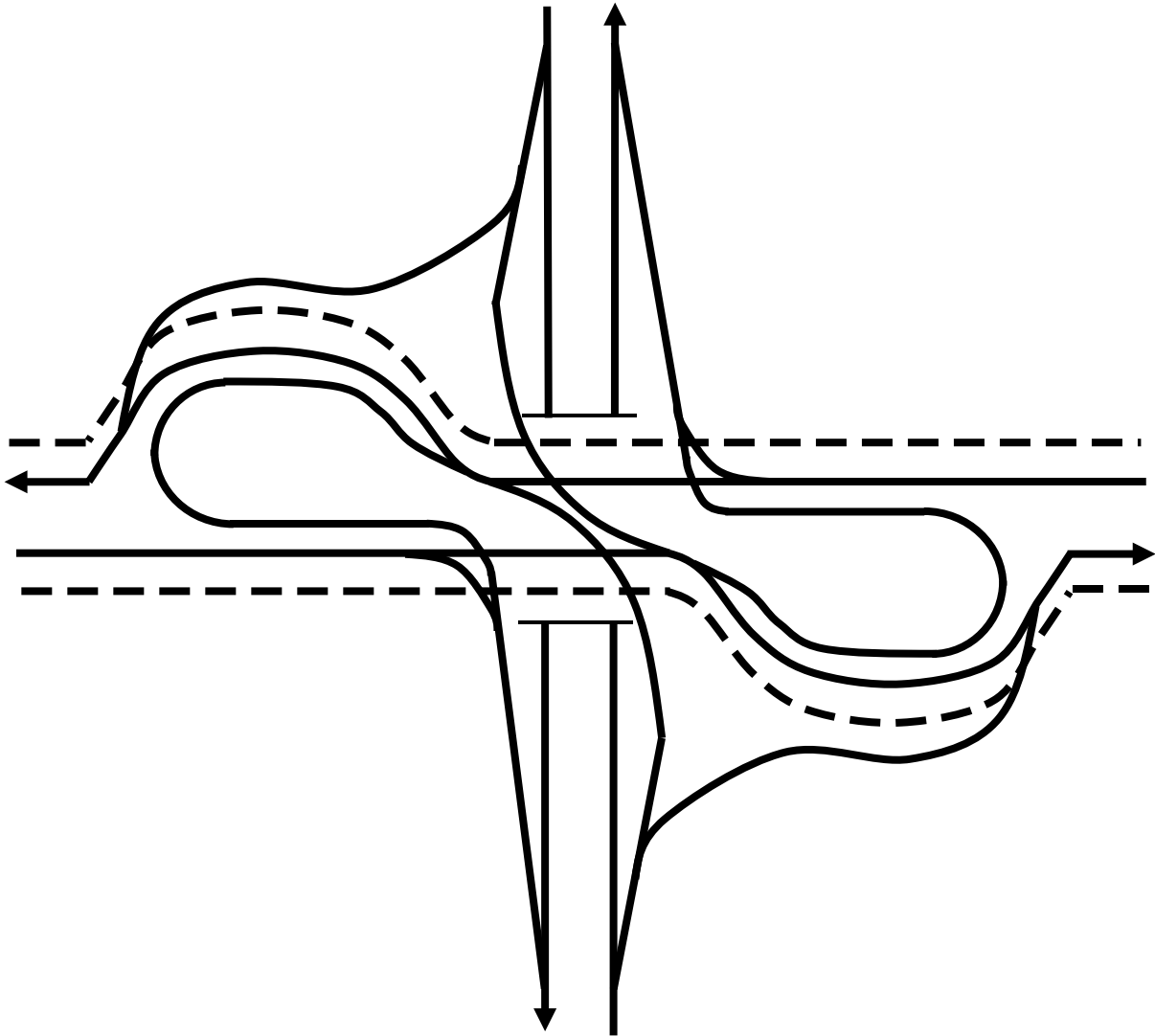
## mmAA, St. Augustine Single Point

**Summary:** Supplies good efficiency and cost scores with short extents along the freeway and a small right of way. This may be the most promising of the designs that use Saint Augustine left turns.

**History:** This is a new design.

**Rank:** 13 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 4           | 4                 | 2               | 4                 | 2                   | 4                  | 3           | 4                 | 5                    | 2                     | 12                 | 12             | 14           | 38            |



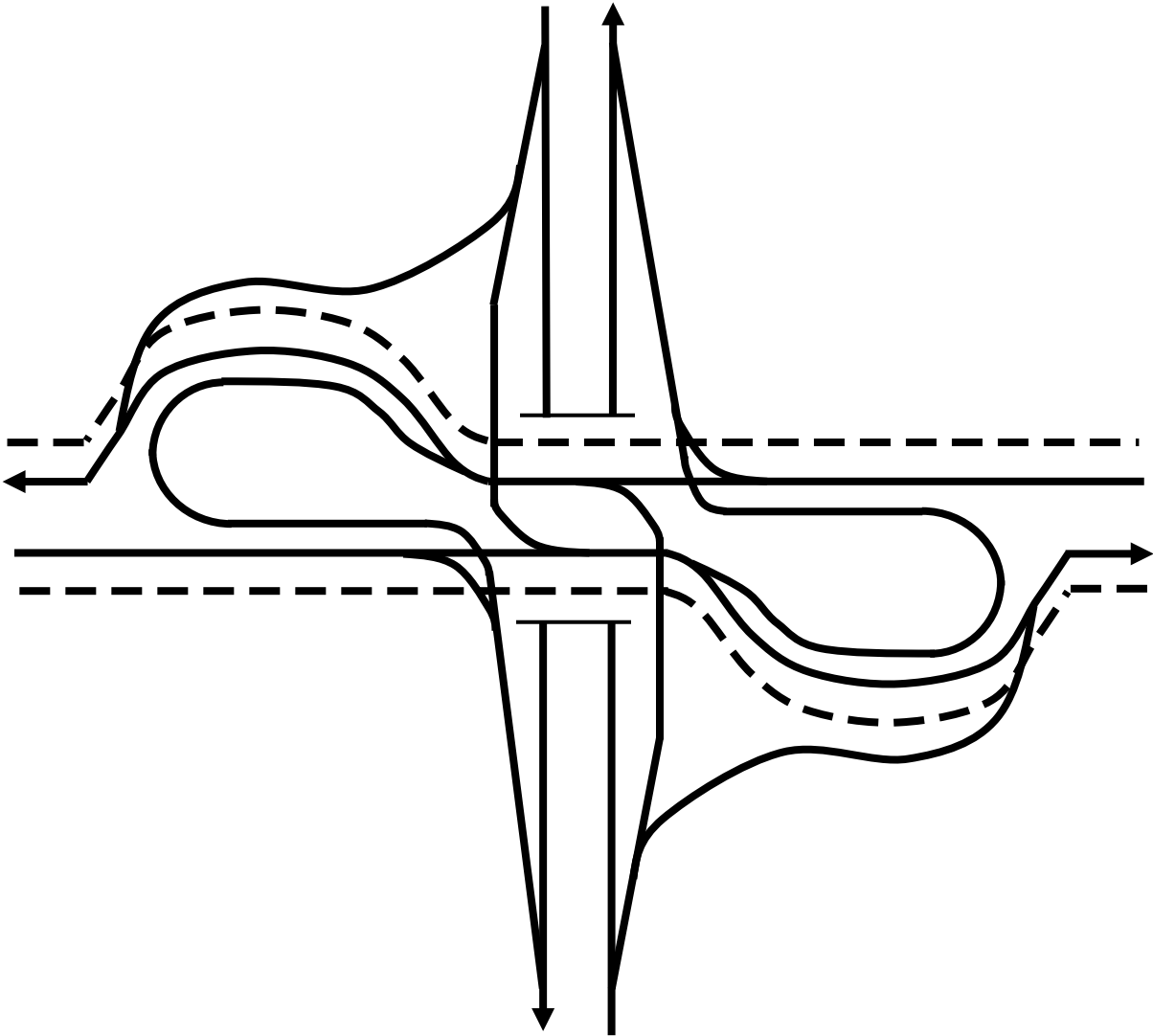
## mmBB, St. Augustine Tight Diamond

**Summary:** Provides good cost scores with a small bridge, small right of way, and short extents along the freeway. Has poor capacity.

**History:** This is a new design.

**Rank:** 23 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 1        | 3           | 4                 | 2               | 4                 | 2                   | 4                  | 5           | 4                 | 5                    | 2                     | 8                  | 12             | 16           | 36            |



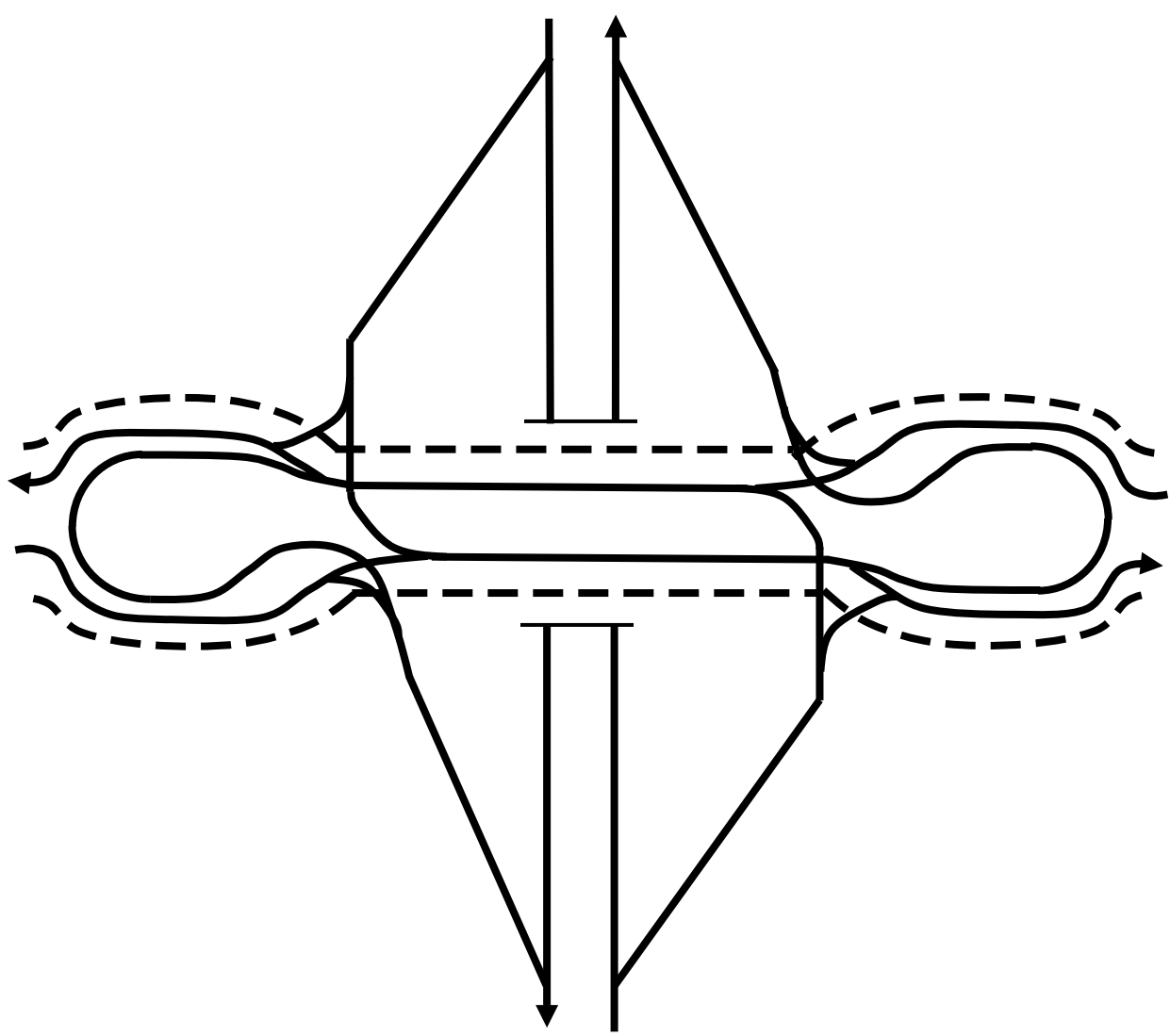
## mmCC, St. Augustine Standard Diamond

**Summary:** Supplies average efficiency, safety, and cost performance. Requires a small bridge, extensive travel distances, and a lengthy extent along the arterial.

**History:** One has opened at I-95 and FL-16 west of Saint Augustine, FL.

**Rank:** 51 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 1           | 3                 | 2               | 4                 | 3                   | 4                  | 5           | 3                 | 4                    | 0                     | 8                  | 13             | 12           | 33            |





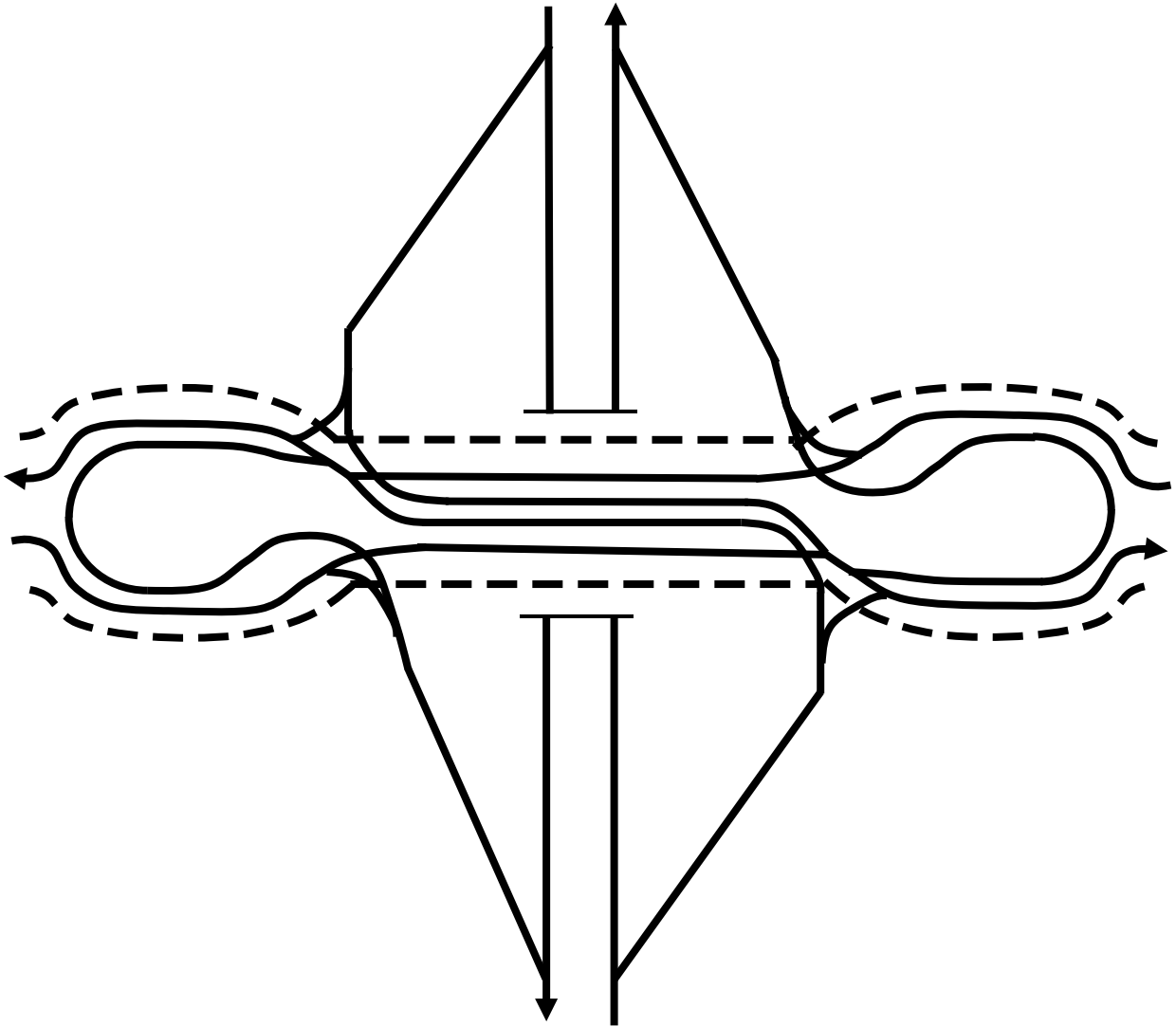
## mmFF, St. Augustine Standard Contraflow

**Summary:** Supplies good efficiency with average safety and cost performance. Has great progression but requires a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 33 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 3                 | 2               | 3                 | 3                   | 4                  | 3           | 3                 | 4                    | 0                     | 12                 | 12             | 10           | 34            |



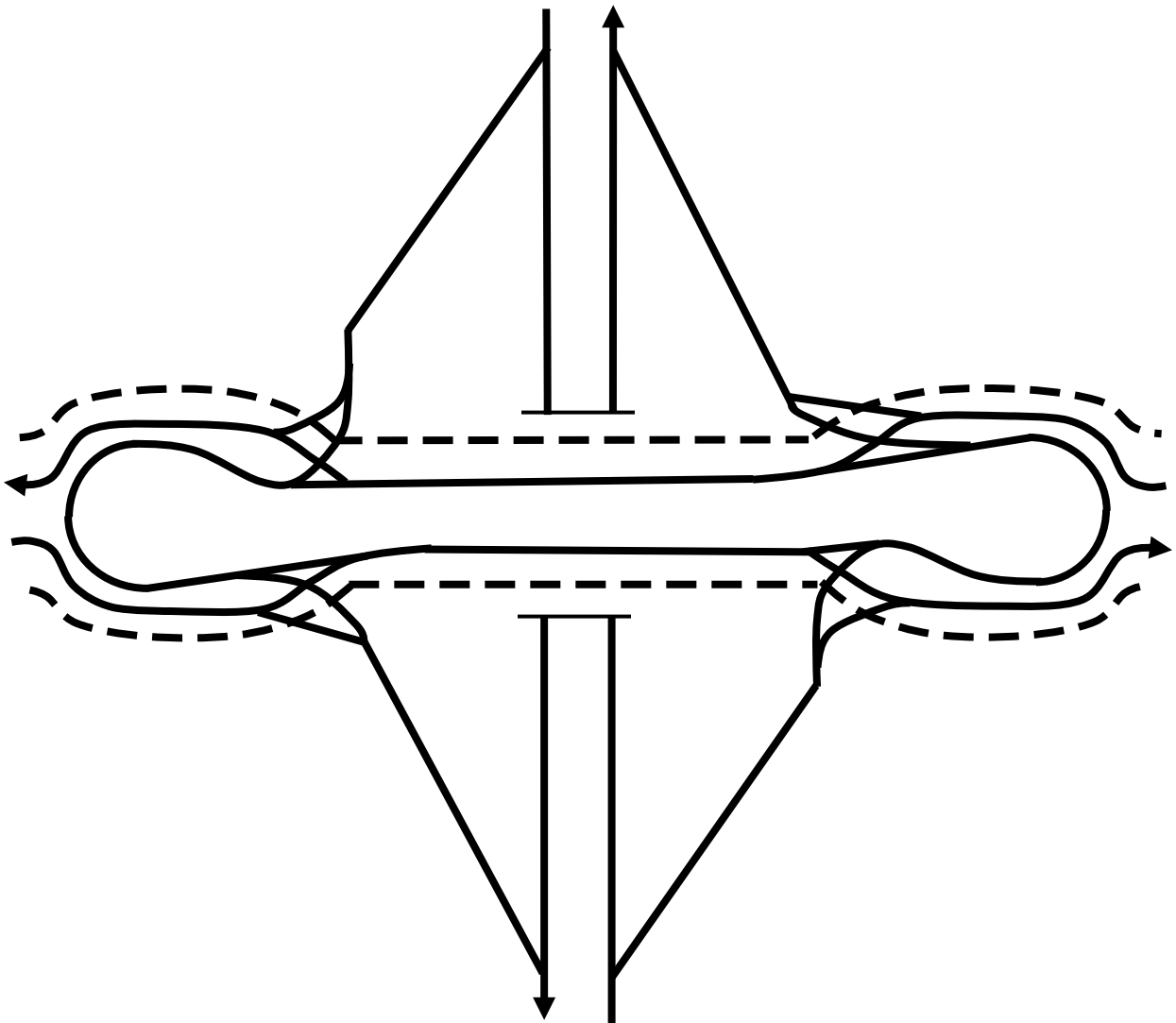
## mmMM, St. Augustine St. Augustine

**Summary:** Supplies average efficiency, safety, and cost performance. Has great progression, requires lengthy travel distances, has a large number of conflict points, and has a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 40 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 1                 | 1               | 3                 | 4                   | 4                  | 4           | 3                 | 4                    | 0                     | 10                 | 12             | 11           | 33            |



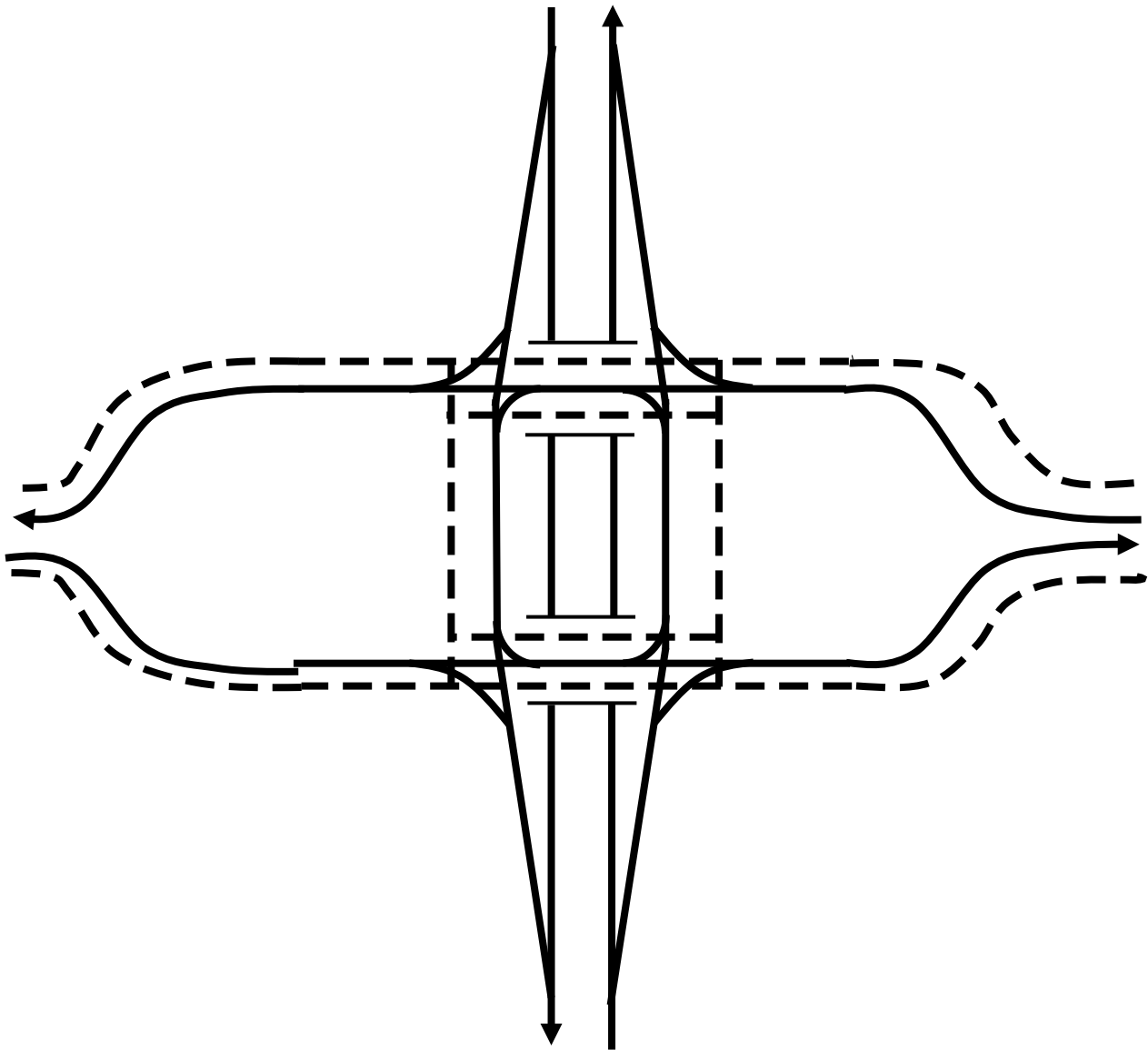
# nnBB, Split Diamond Tight Diamond

**Summary:** Supplies good efficiency and cost scores. Has great progression but a high number of conflict points and a lengthy extent along the arterial. The right of way need is not high because the area between the arterial one-way streets is developable.

**History:** This design is in operation in a few spots across the US, primarily in downtown areas at interchanges with one-way pairs.

**Rank:** 11 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 5           | 3                 | 1               | 4                 | 2                   | 5                  | 4           | 4                 | 3                    | 5                     | 11                 | 12             | 16           | 39            |



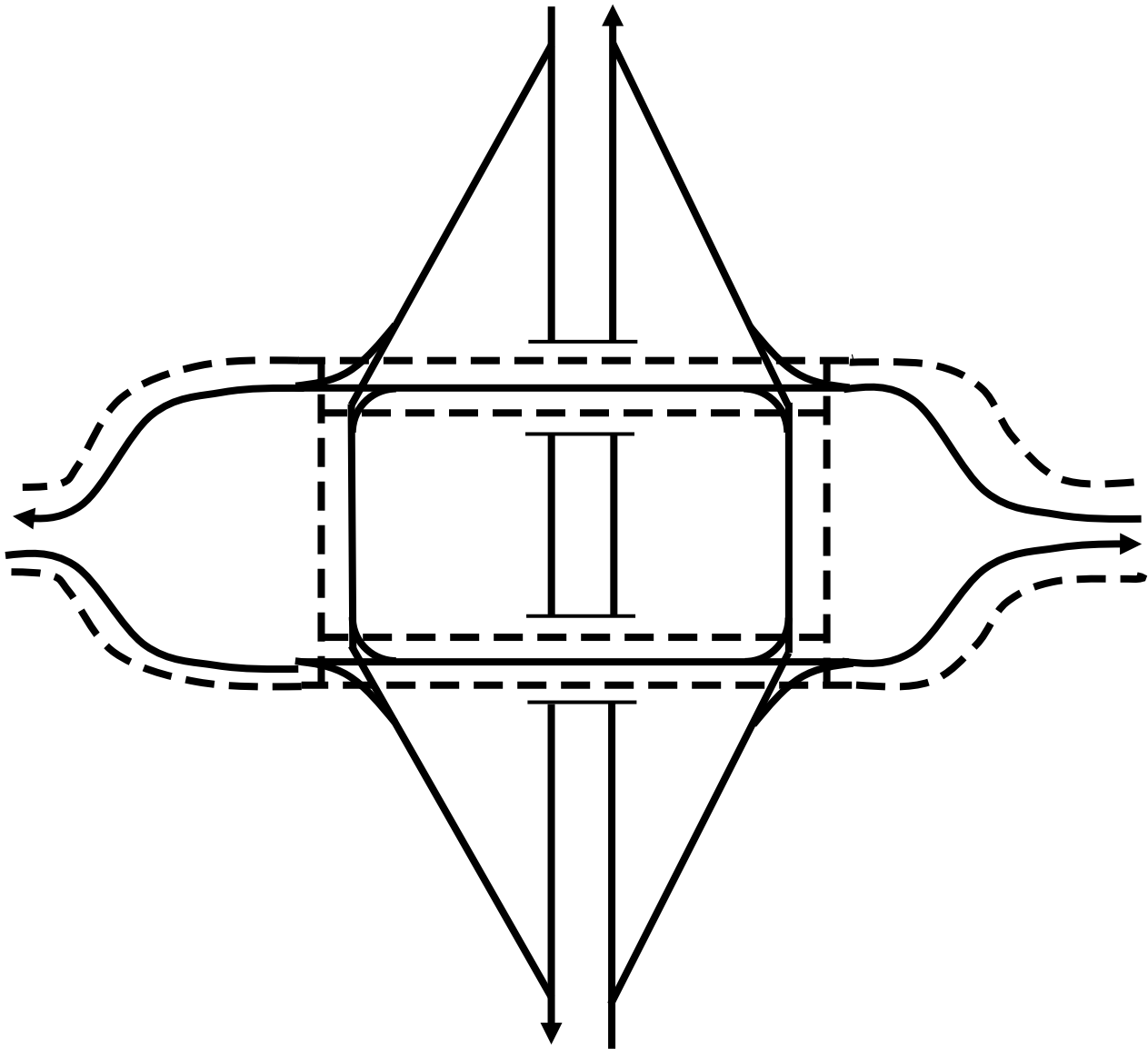
nnCC, Split Diamond Standard Diamond

**Summary:** Supplies average efficiency, safety, and cost performance. Requires lengthy travel distances and has a large number of conflict points.

**History:** This design may be in place somewhere in the US.

**Rank:** 46 of 108.

|          |             |                   |                 |                   |                     |                    |             |                   |                      |                       |                    |                |              |               |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
| 4        | 5           | 1                 | 1               | 4                 | 2                   | 4                  | 4           | 2                 | 3                    | 3                     | 10                 | 11             | 12           | 33            |

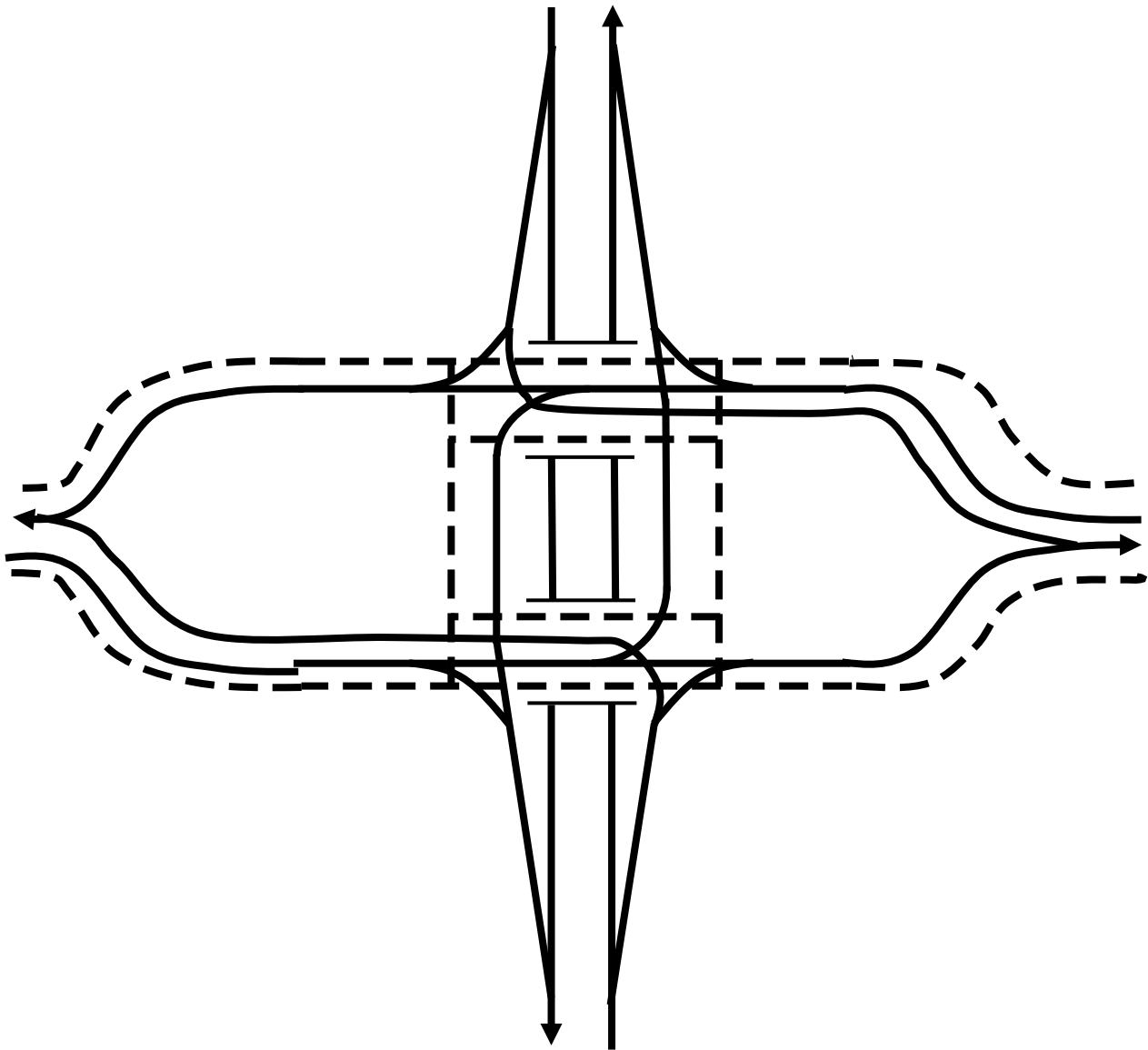


nnEE, Split Diamond Tight Contraflow

**Summary:** Supplies good efficiency and cost performance. Has great progression, small extents along the arterial, and a large number of conflict points. The right of way need is not high because the area between the arterial one-way streets is developable.

**History:** This is a new design.  
**Rank:** 10 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 5           | 4                 | 0               | 4                 | 3                   | 5                  | 3           | 4                 | 3                    | 5                     | 12                 | 12             | 15           | 39            |



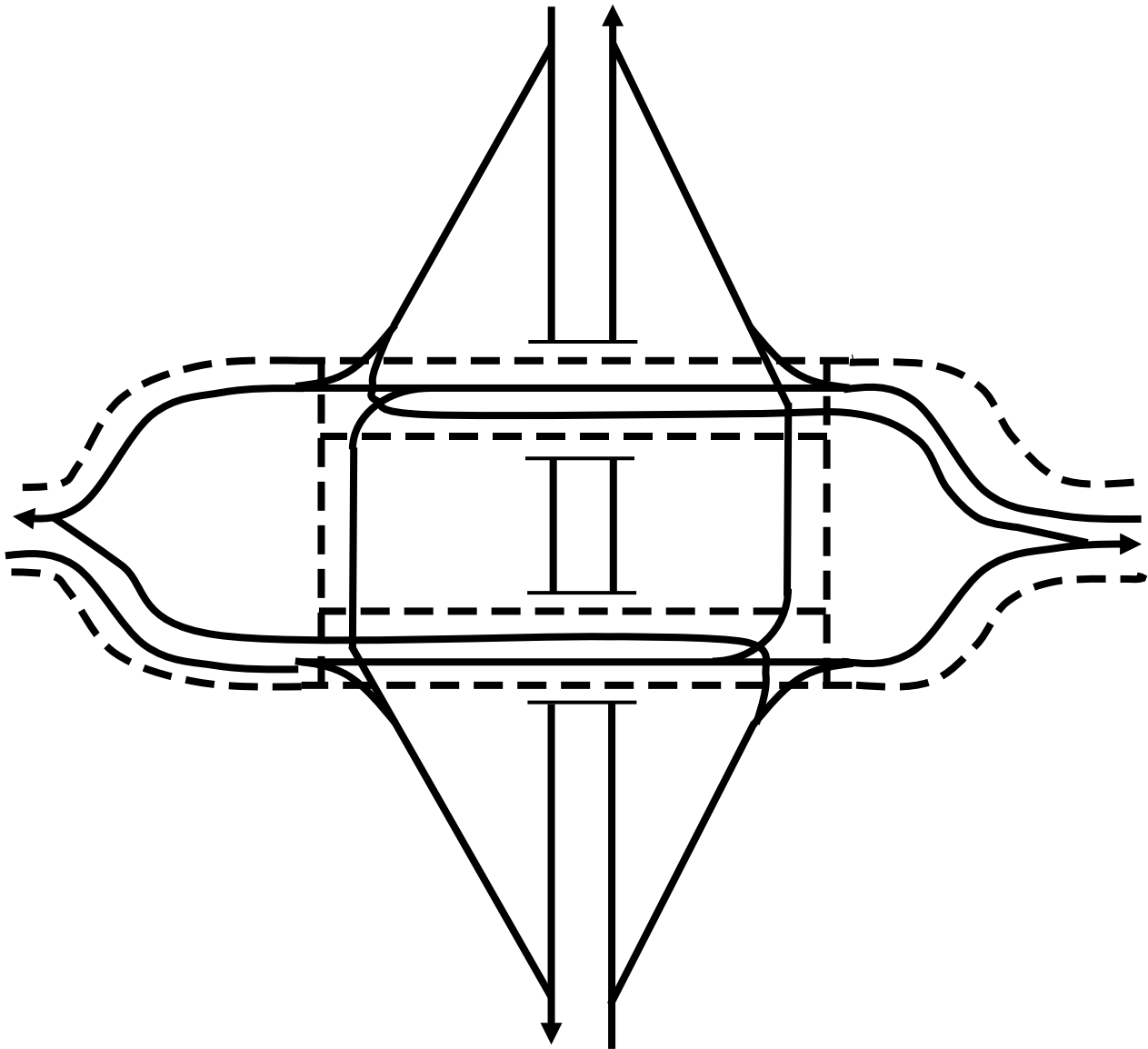
nnFF, Split Diamond Standard Contraflow

**Summary:** Supplies good efficiency with great progression. Has a large number of conflict points.

**History:** This is a new design.

**Rank:** 43 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 2                 | 0               | 4                 | 3                   | 4                  | 3           | 2                 | 3                    | 3                     | 11                 | 11             | 11           | 33            |



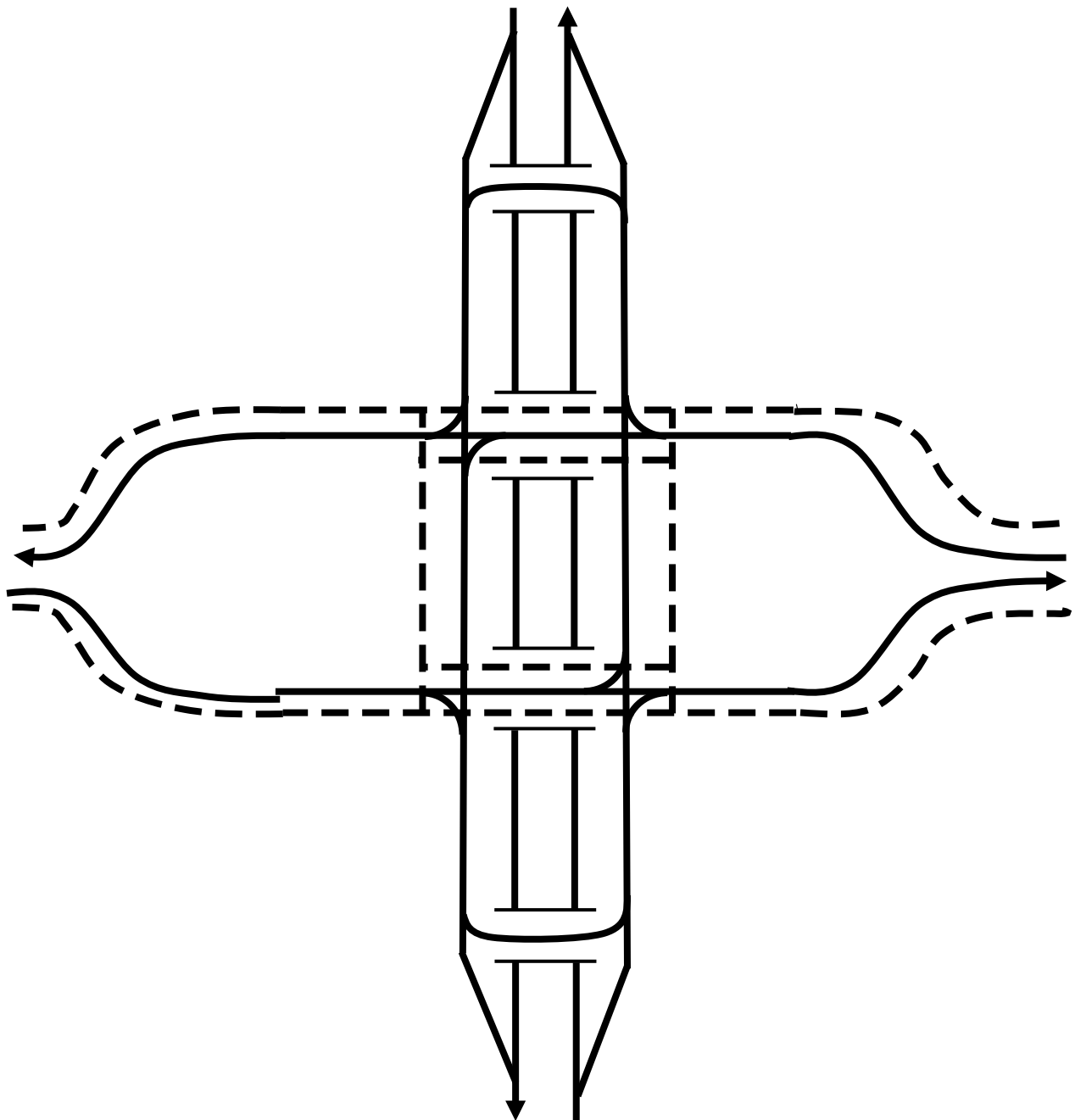
## nnKK, Split Diamond U-Turn over Freeway

**Summary:** Provides good safety and cost performance. Results in lengthy travel distances, a high number of conflict points, and a lengthy extent along the freeway.

**History:** This is a new design.

**Rank:** 41 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 5           | 1                 | 1               | 3                 | 3                   | 5                  | 4           | 3                 | 1                    | 5                     | 8                  | 12             | 13           | 33            |



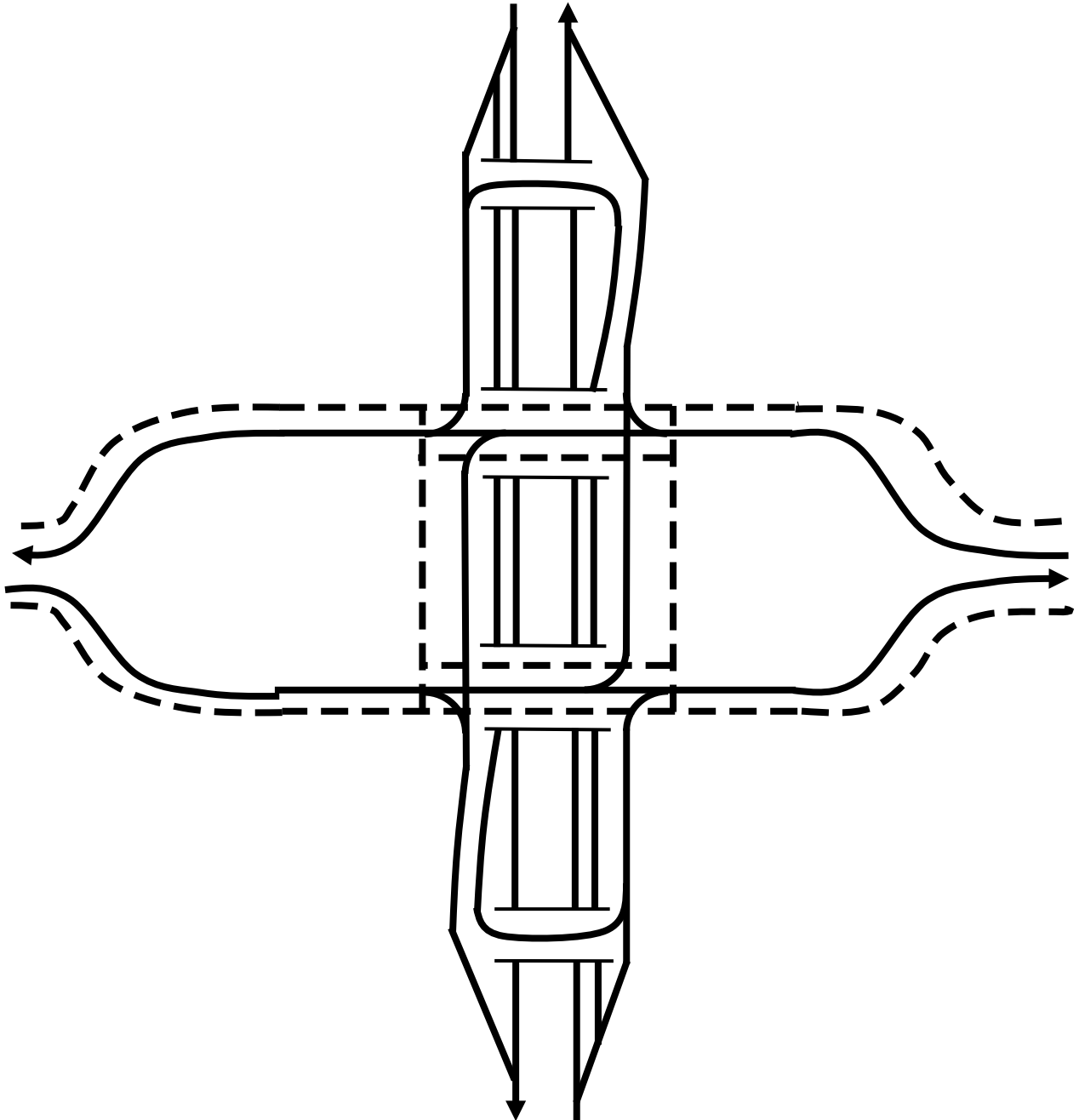
## nnLL, Split Diamond U-Turn over Freeway with Slip Ramp

**Summary:** Provides good efficiency and safety performance. Requires lengthy travel distances and extents along the freeway.

**History:** This is a new design.

**Rank:** 15 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 1                 | 3               | 5                 | 3                   | 5                  | 3           | 2                 | 0                    | 5                     | 11                 | 16             | 10           | 37            |





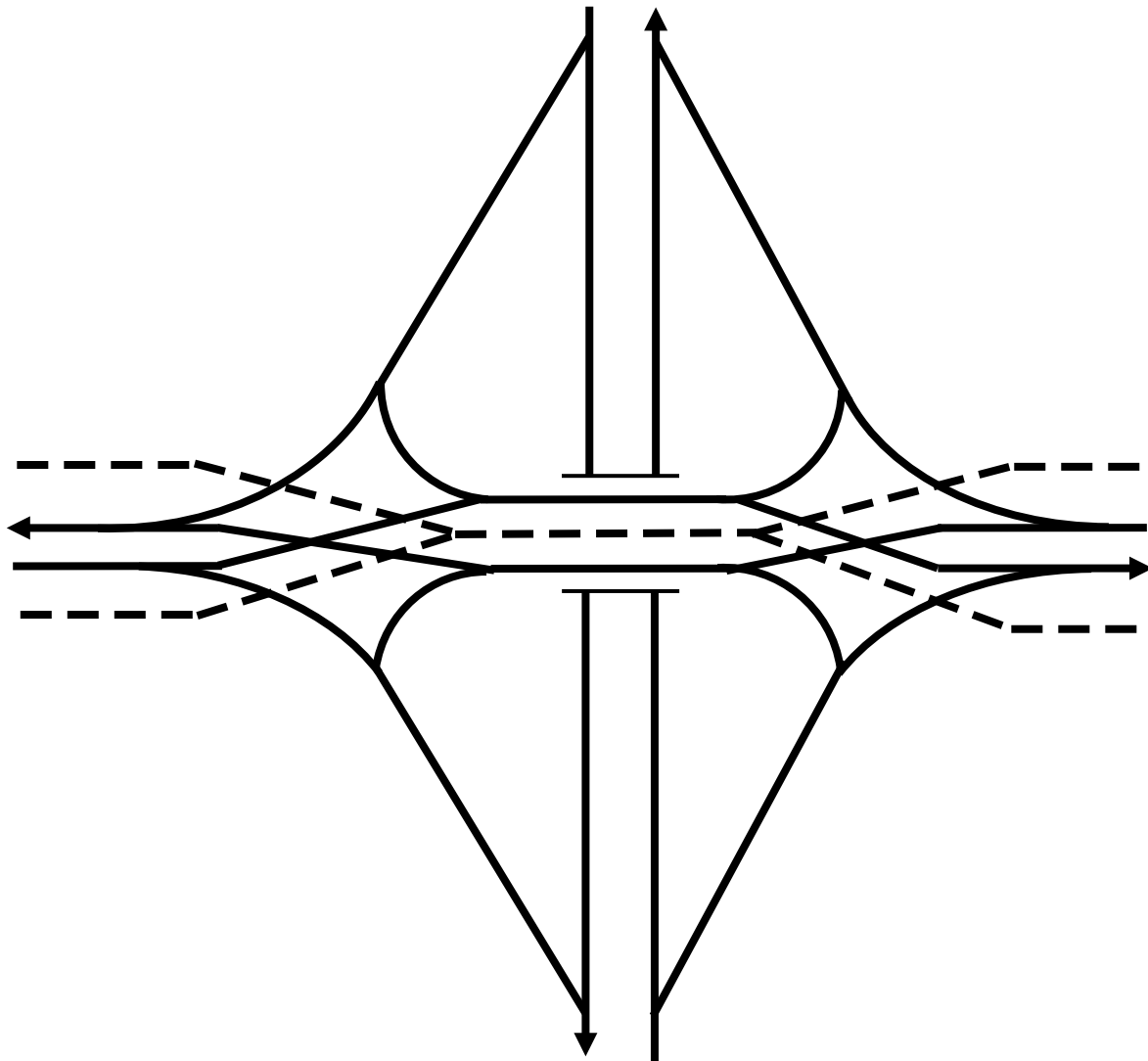
## No Code, Diverging Diamond Interchange (DDI)

**Summary:** Supplies poor efficiency, but has good safety and great cost scores. Has poor capacity and progression but requires minimal extra travel distance and has a small bridge.

**History:** First constructed in France in the 1960s and 1970s. The first DDI in the US opened in 2009. Since then, they have become a common interchange design in the US.

**Rank:** 37 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 0        | 1           | 5                 | 3               | 2                 | 3                   | 4                  | 5           | 4                 | 4                    | 3                     | 6                  | 12             | 16           | 34            |



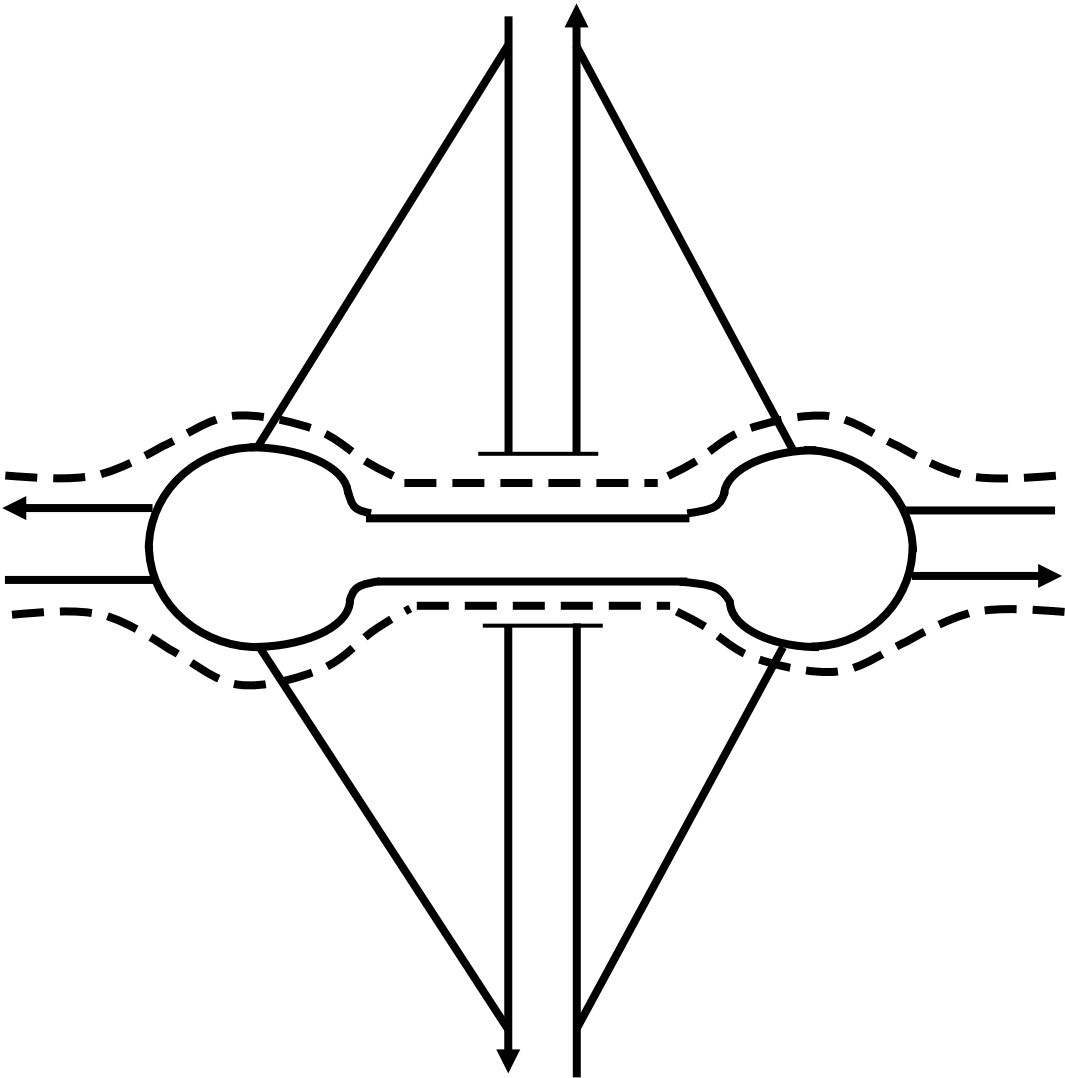
## No Code, Double Roundabout

**Summary:** Supplies good efficiency with great safety and cost scores. Has low capacity but no other apparent weaknesses.

**History:** This is now a common design in the US, particularly in rural and low-demand locations.

**Rank:** 1 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 5           | 4                 | 5               | 5                 | 4                   | 3                  | 5           | 4                 | 4                    | 3                     | 11                 | 17             | 16           | 44            |



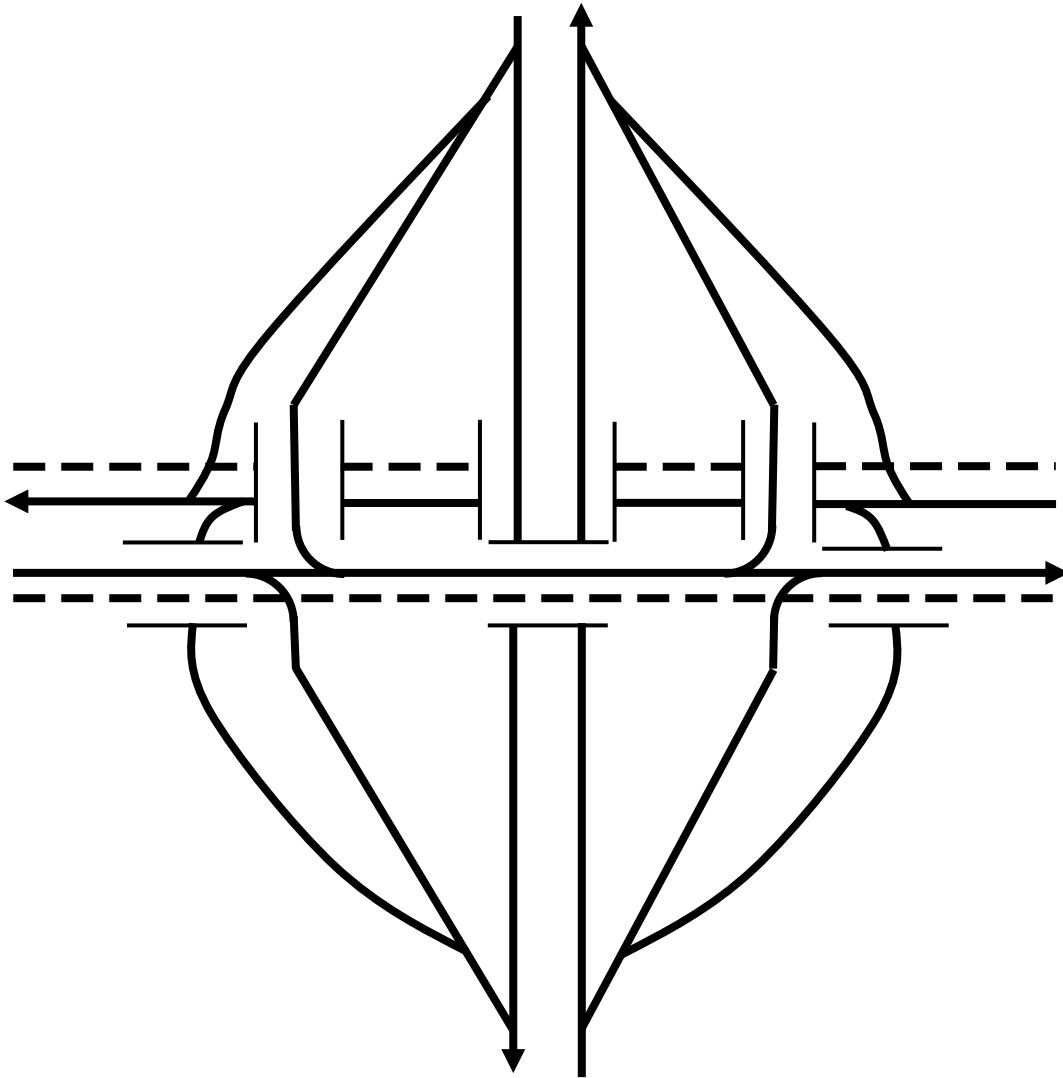
## No Code, Over-Under Three Level

**Summary:** Supplies great efficiency and good safety performance. Has poor cost performance with a large bridge and a lengthy extent along the freeway and arterial.

**History:** This is a new design. A version of this concept is under construction at I-440 and Wade Avenue in Raleigh, NC.

**Rank:** 60 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 4        | 5           | 4                 | 4               | 5                 | 3                   | 3                  | 0           | 3                 | 1                    | 0                     | 13                 | 15             | 4            | 32            |



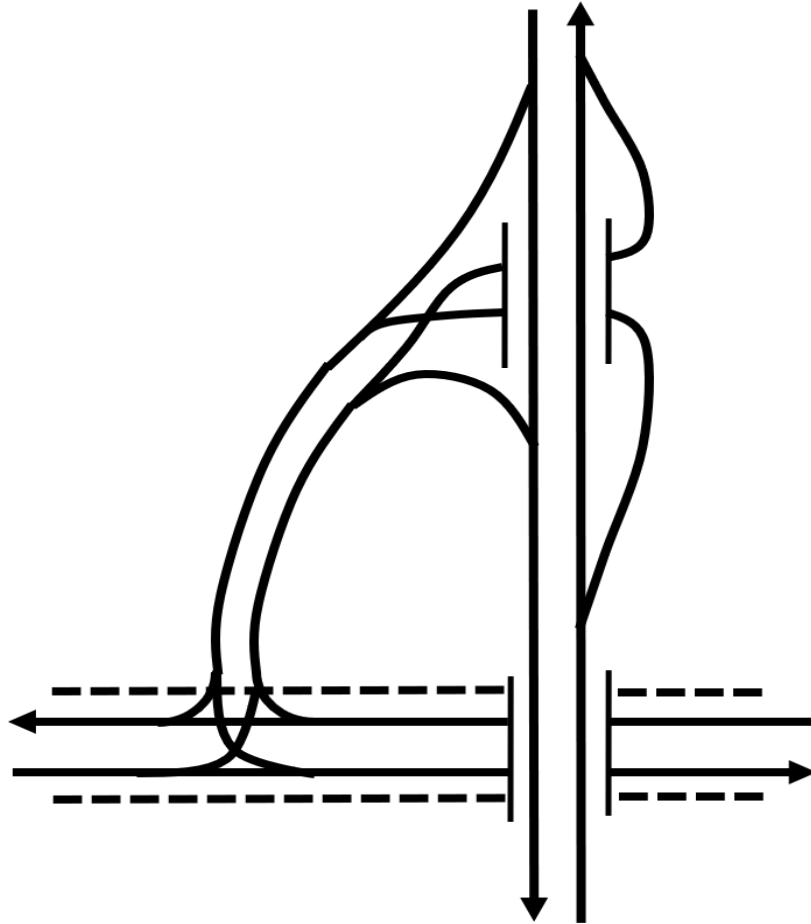
## No Code, Single Quadrant Half DDI

**Summary:** Supplies poor efficiency but good cost scores. Requires lengthy travel distances but has great pedestrian quality, and short extents along the freeway and arterial.

**History:** It is likely that this design has been constructed in the US.

**Rank:** 27 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 3           | 0                 | 3               | 2                 | 3                   | 5                  | 3           | 4                 | 4                    | 5                     | 6                  | 13             | 16           | 35            |



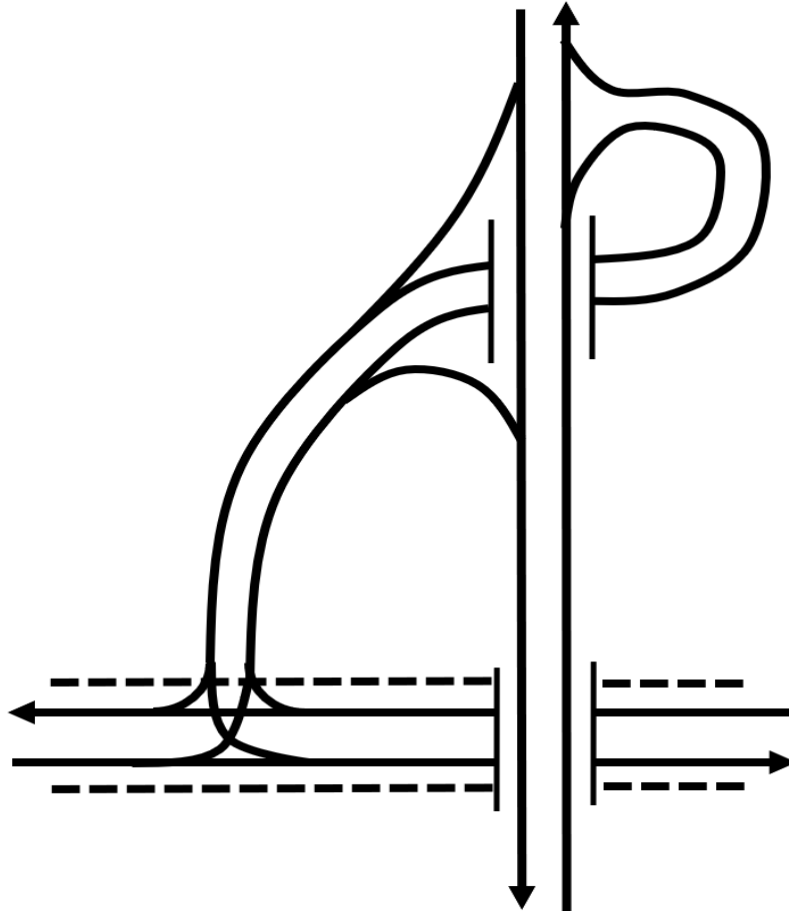
## No Code, Single Quadrant Loop

**Summary:** Provides poor efficiency but good safety and cost scores. Requires lengthy travel distances, but has great pedestrian quality and short extents along the freeway and arterial.

**History:** This is a fairly common design, particularly on toll facilities and where right of way is constrained in several quadrants.

**Rank:** 35 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 3        | 3           | 0                 | 4               | 2                 | 3                   | 5                  | 3           | 2                 | 4                    | 5                     | 6                  | 14             | 14           | 34            |



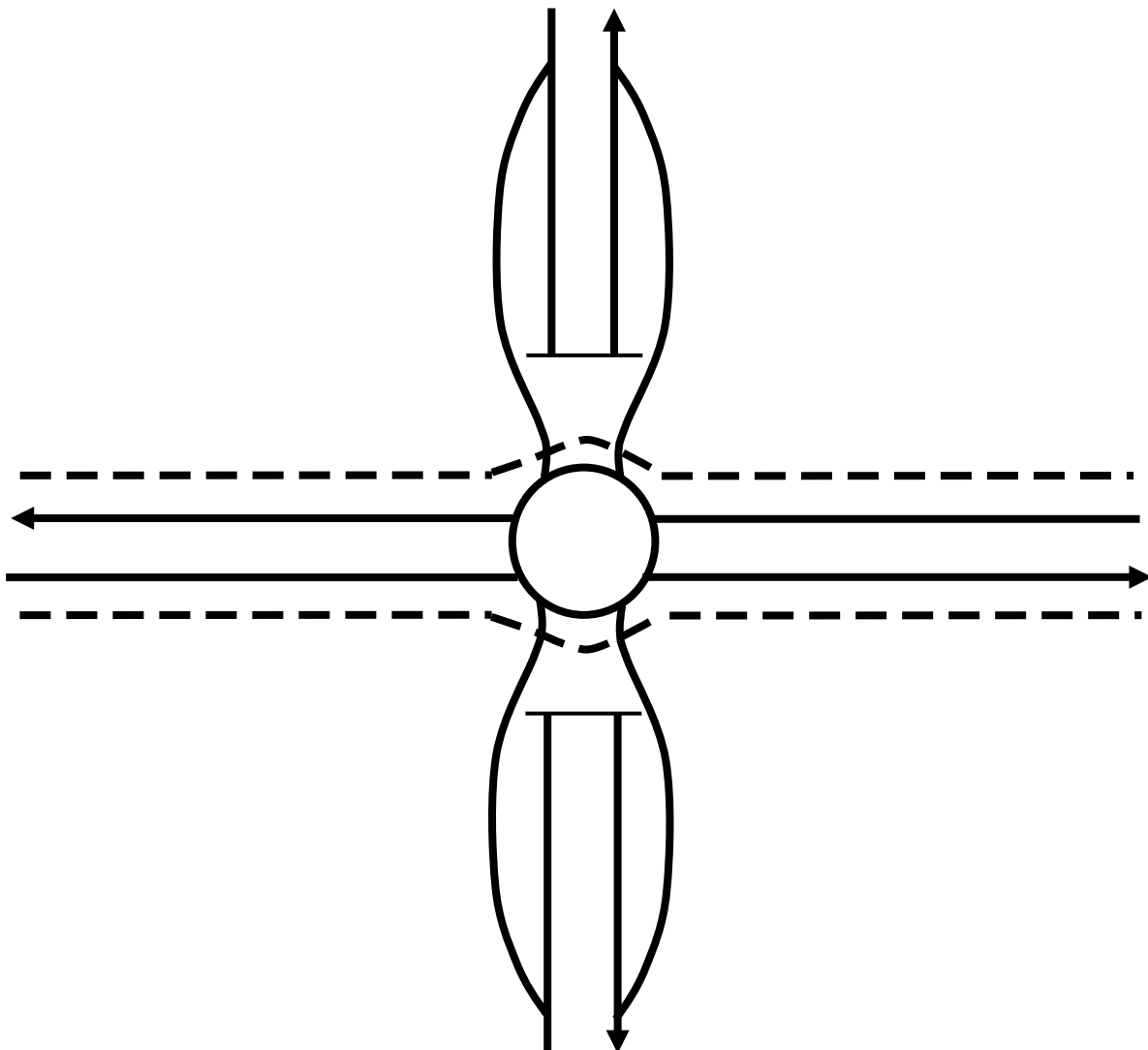
## No Code, Single Roundabout

**Summary:** Provides good efficiency and safety performance in a small right of way. Requires a large bridge.

**History:** This design is fairly common in Europe and a few older versions operate in the US.

**Rank:** 7 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 2        | 5           | 5                 | 5               | 5                 | 3                   | 3                  | 0           | 4                 | 4                    | 3                     | 12                 | 16             | 11           | 39            |



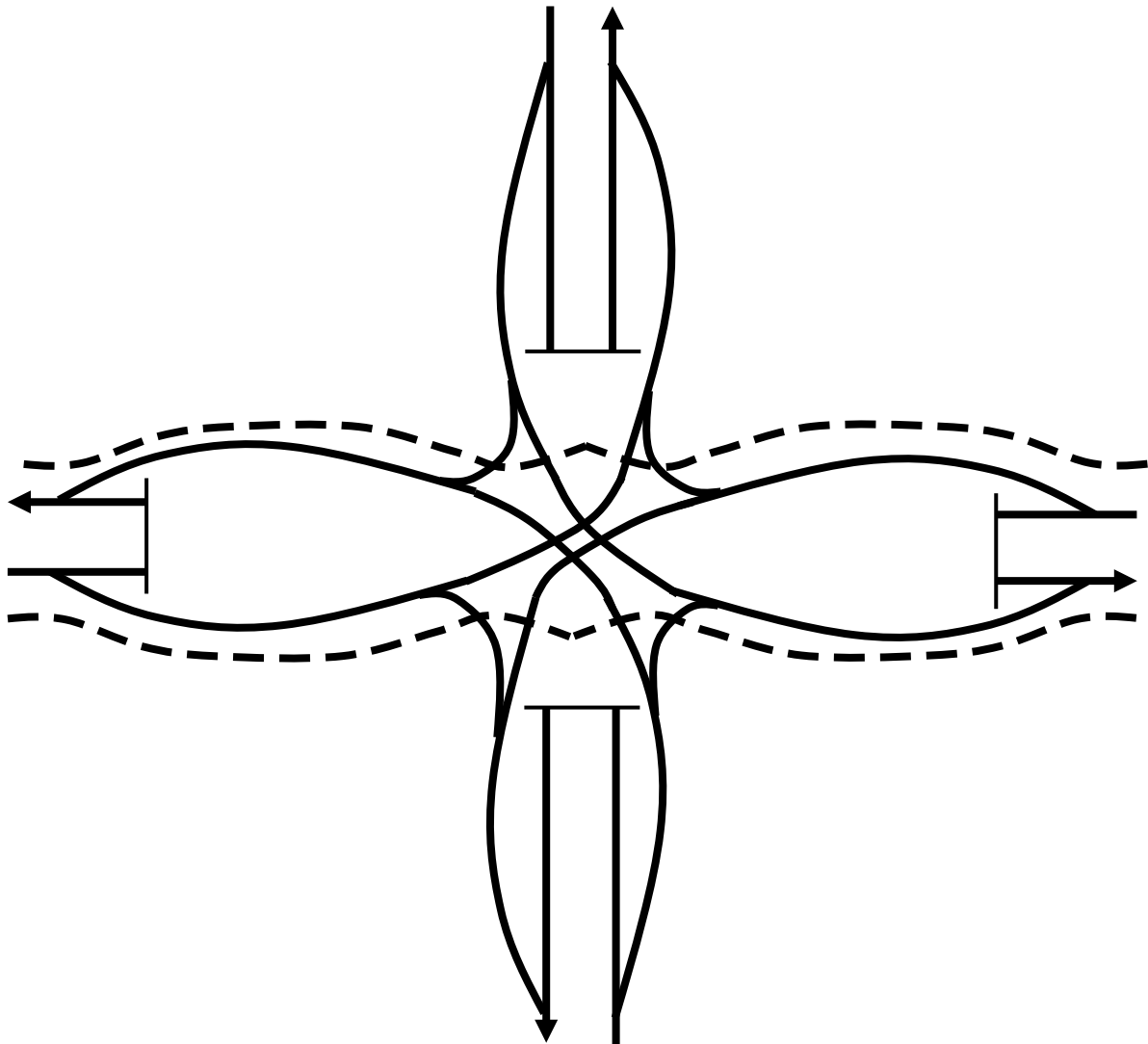
## No Code, Three Level Center Turn

**Summary:** Meets ideal efficiency criteria but has poor cost performance. Requires two large bridges and a lengthy extent along the arterial.

**History:** This is a new design.

**Rank:** 52 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 5                 | 2               | 5                 | 2                   | 2                  | 0           | 4                 | 3                    | 0                     | 15                 | 11             | 7            | 33            |



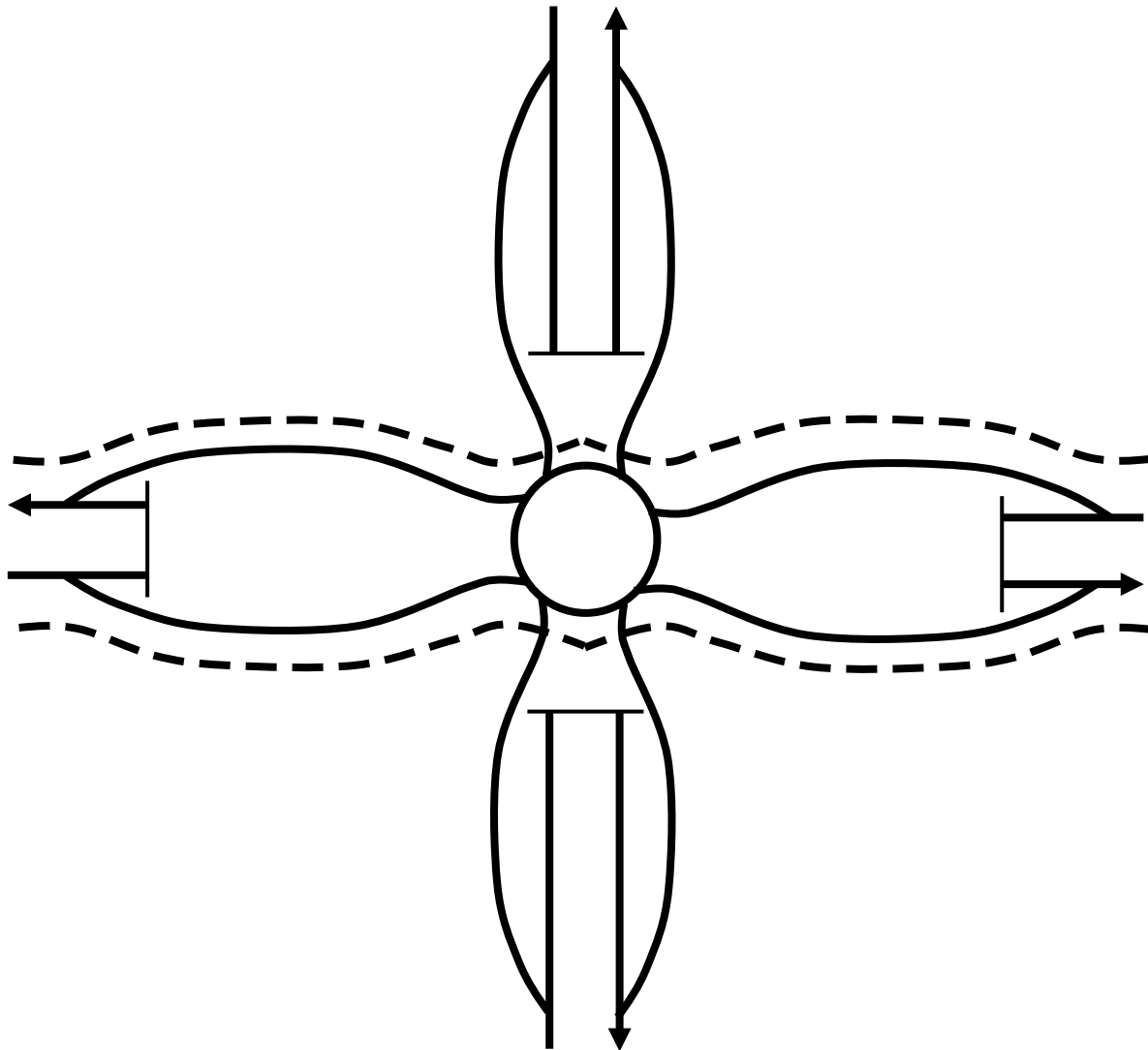
## No Code, Three Level One Roundabout

**Summary:** Meets ideal efficiency criteria and has good safety performance. Requires a large bridge and a lengthy extent along the arterial.

**History:** This is a new design in the US.

**Rank:** 14 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 5                 | 4               | 5                 | 4                   | 3                  | 0           | 4                 | 3                    | 0                     | 15                 | 16             | 7            | 38            |





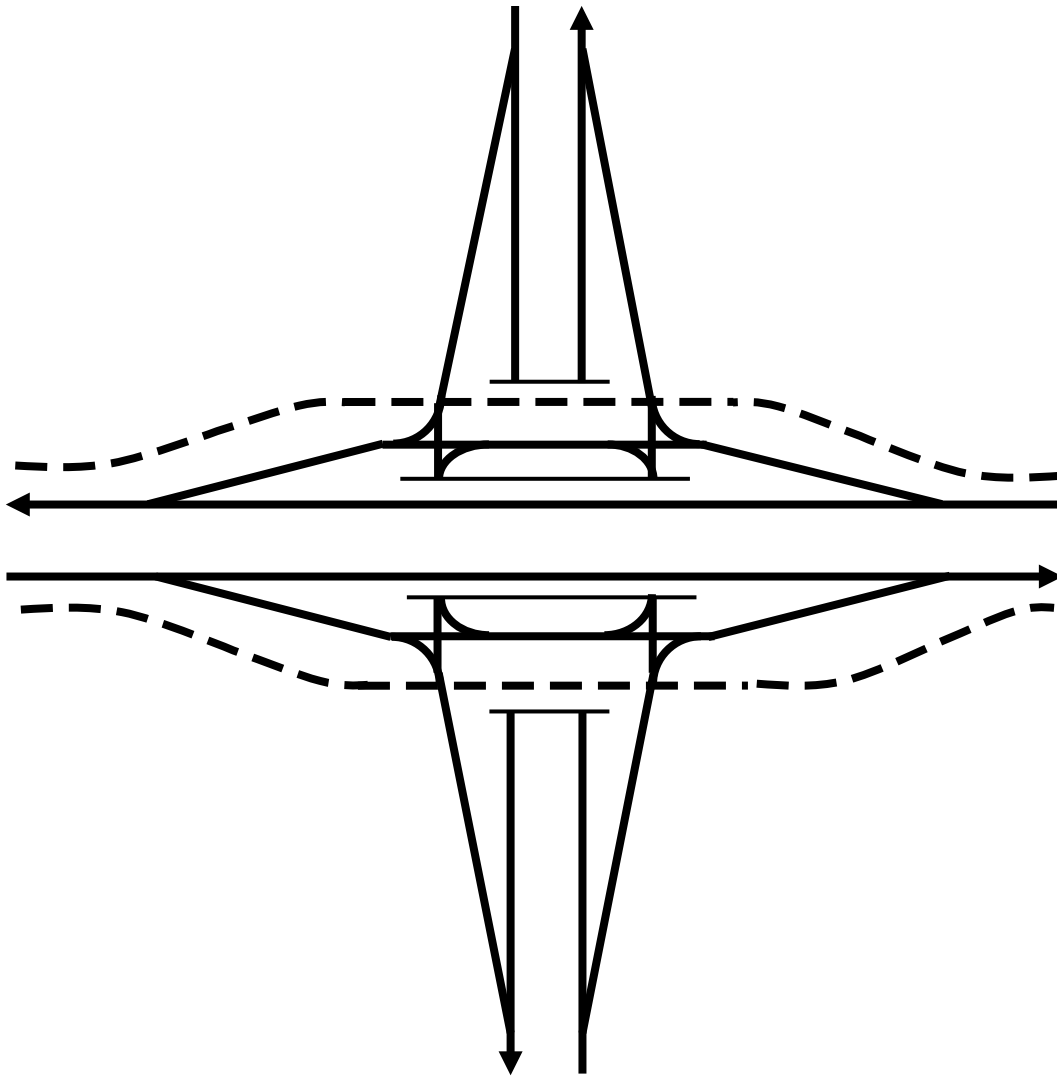
## No Code, Three Level Traditional

**Summary:** Meets ideal efficiency criteria. Requires two large bridges, needs a long extent along the arterial, and results in a large number of conflict points.

**History:** First constructed in the 1960s, this is now a fairly common design built in over a dozen states.

**Rank:** 18 of 108.

| Capacity | Progression | Distance Traveled | Conflict Points | Unusual Maneuvers | Wrong Way Potential | Pedestrian Quality | Bridge Size | Right of Way Size | Extent Along Freeway | Extent Along Arterial | Efficiency (of 15) | Safety (of 20) | Cost (of 20) | Total (of 55) |
|----------|-------------|-------------------|-----------------|-------------------|---------------------|--------------------|-------------|-------------------|----------------------|-----------------------|--------------------|----------------|--------------|---------------|
| 5        | 5           | 5                 | 0               | 5                 | 3                   | 5                  | 0           | 4                 | 5                    | 0                     | 15                 | 13             | 9            | 37            |



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