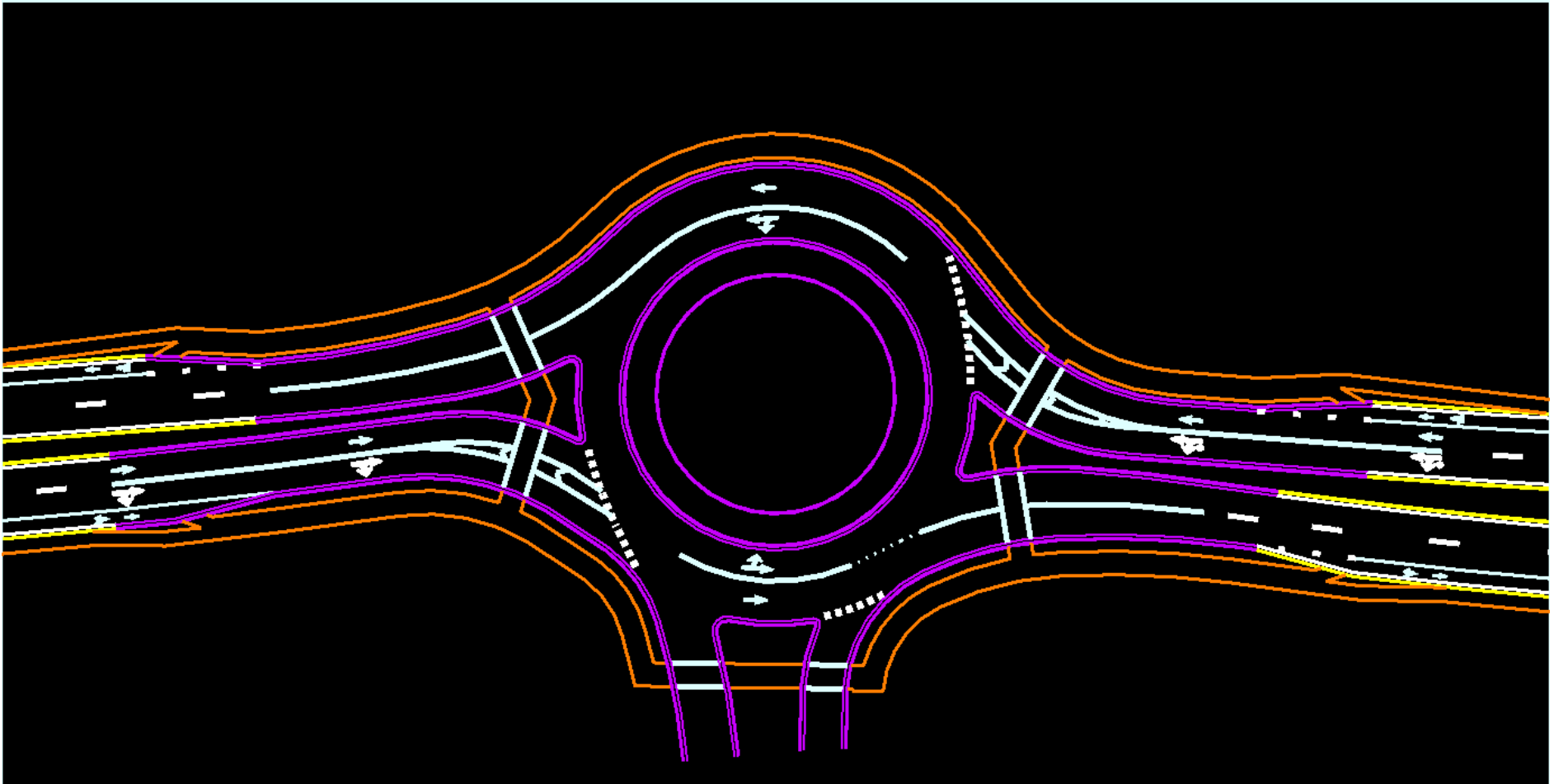


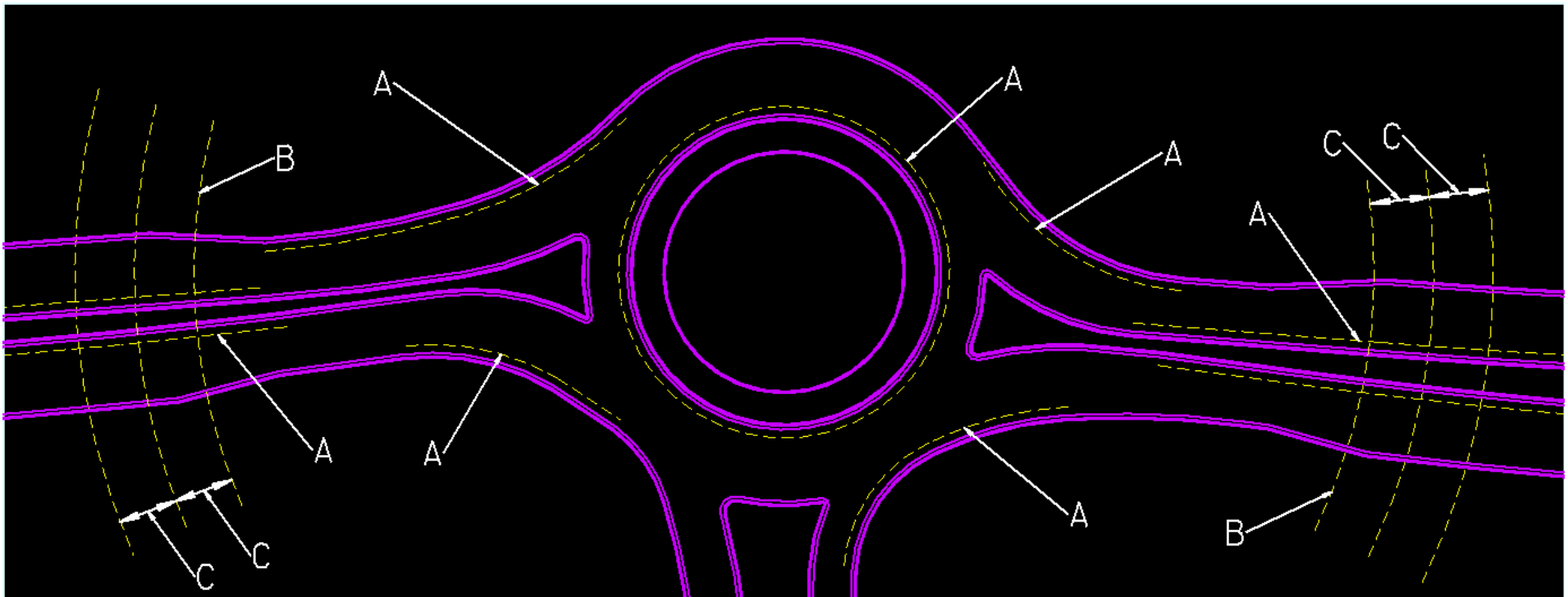
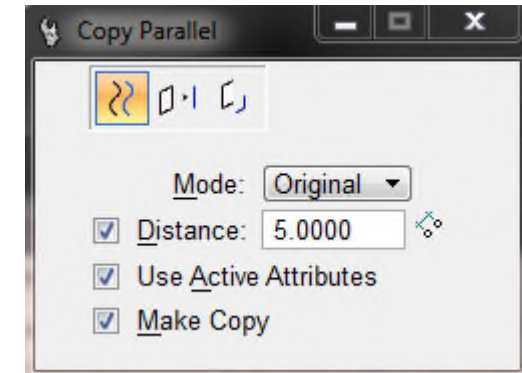
Creating Fastest Paths in MicroStation



Creating Through ($R_1 - R_3$) Fastest Paths

1) Create path offsets

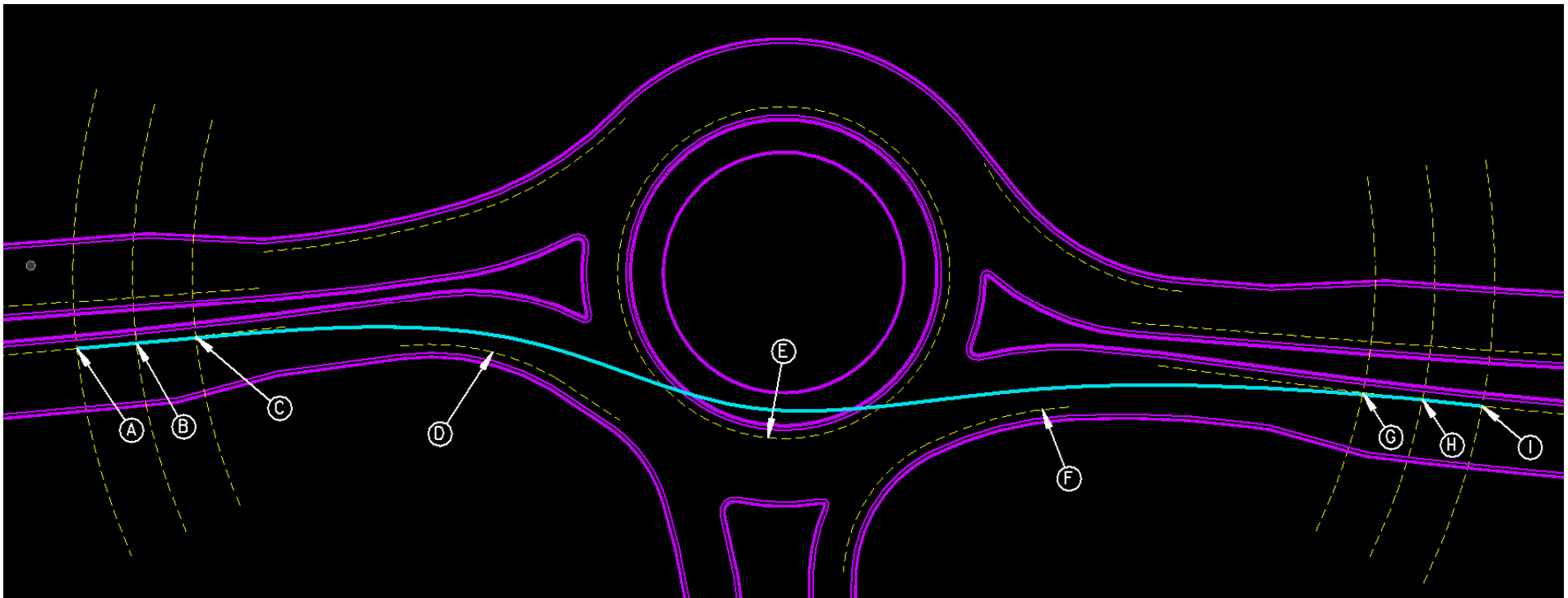
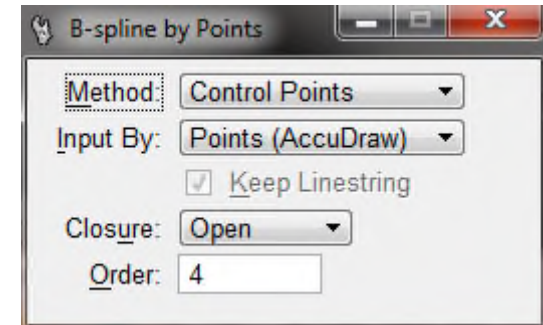
- A. 5' from curb faces (3' from paint lines)
- B. 165' from ICD (Could be more depending on how vehicle would approach the yield line)
- C. ~25'



Creating Through ($R_1 - R_3$) Fastest Paths

2) Draw Spline Curve

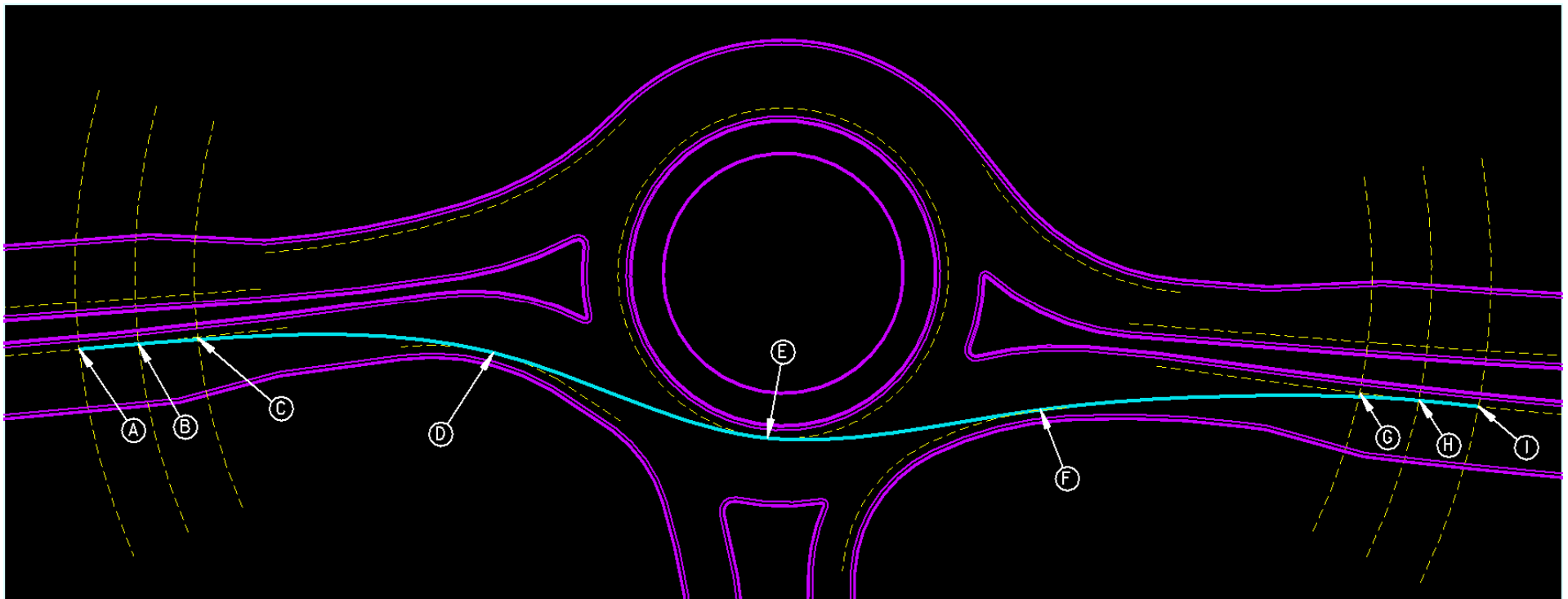
A. Choose points A through I



Creating Through ($R_1 - R_3$) Fastest Paths

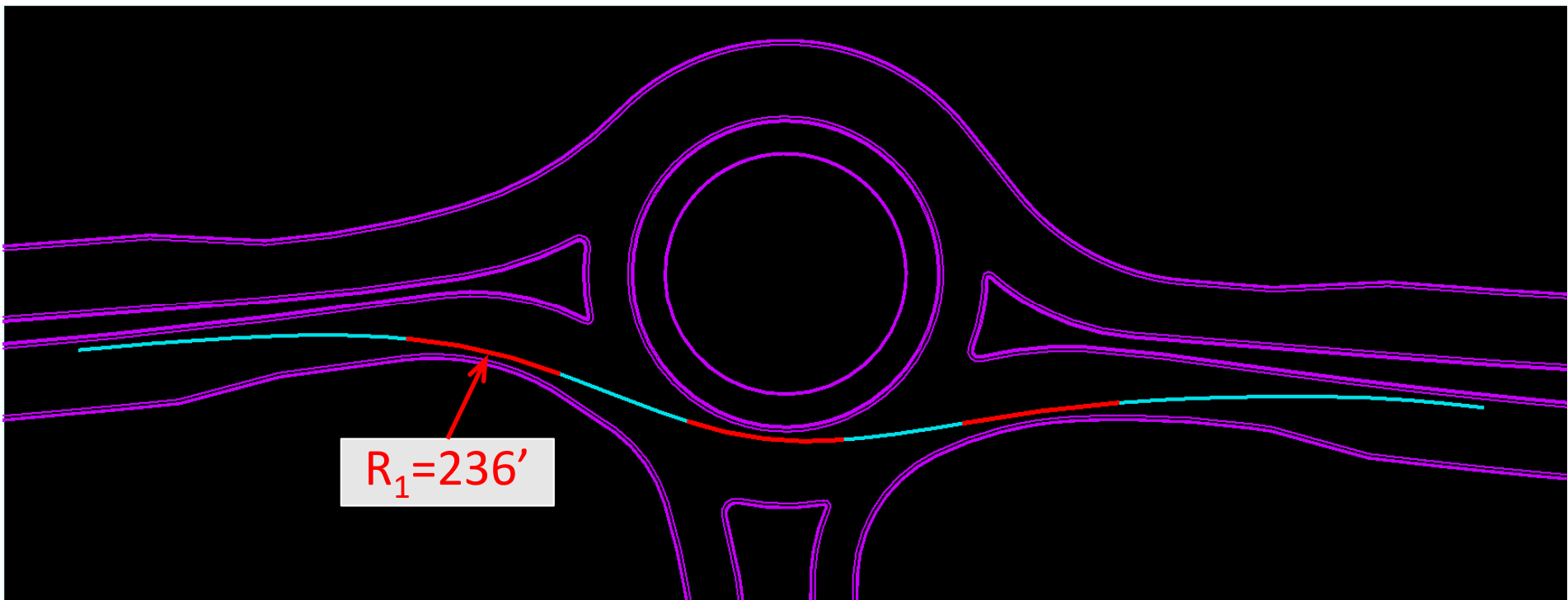
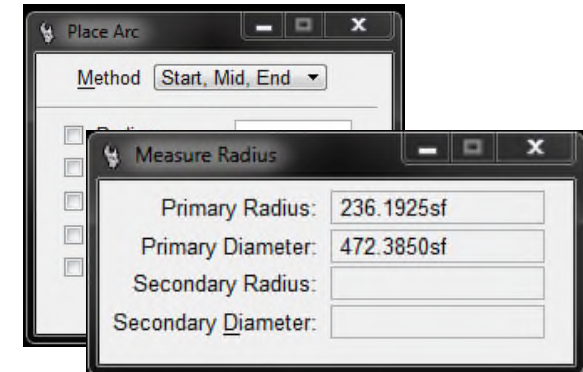
3) Modify Spline Curve

- A. Modify points D, E and F to hit offset lines
- B. Evaluate the entire spline to see if it looks like a path a vehicle would use



Creating Through ($R_1 - R_3$) Fastest Paths

- 4) Place Arc
 - A. Smallest best-fit curves over 65' – 80'
- 5) Measure the radius



Creating Through ($R_1 - R_3$) Fastest Paths

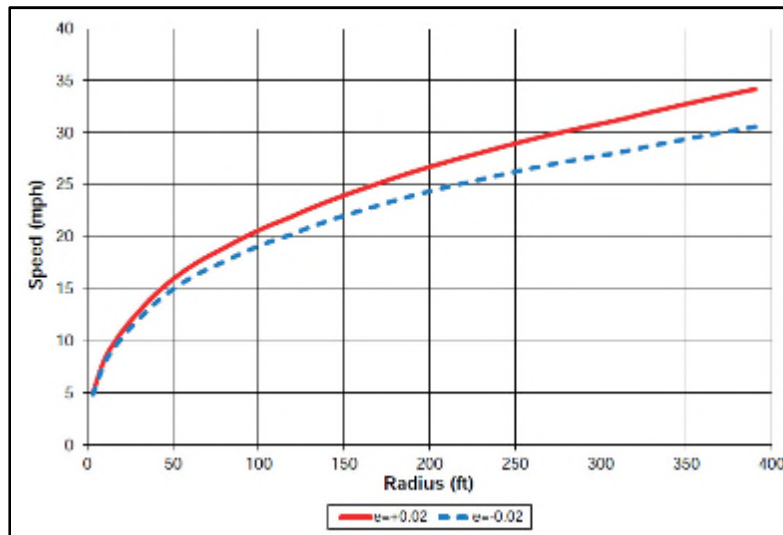
$$V = 3.4415R^{0.3861}, \text{ for } e = +0.02$$

$$V = 3.4614R^{0.3673}, \text{ for } e = -0.02$$

where

V = predicted speed, mph;
 R = radius of curve, ft; and
 e = superelevation, ft/ft.

NCHRP 672 Equations 6-1 and 6-2

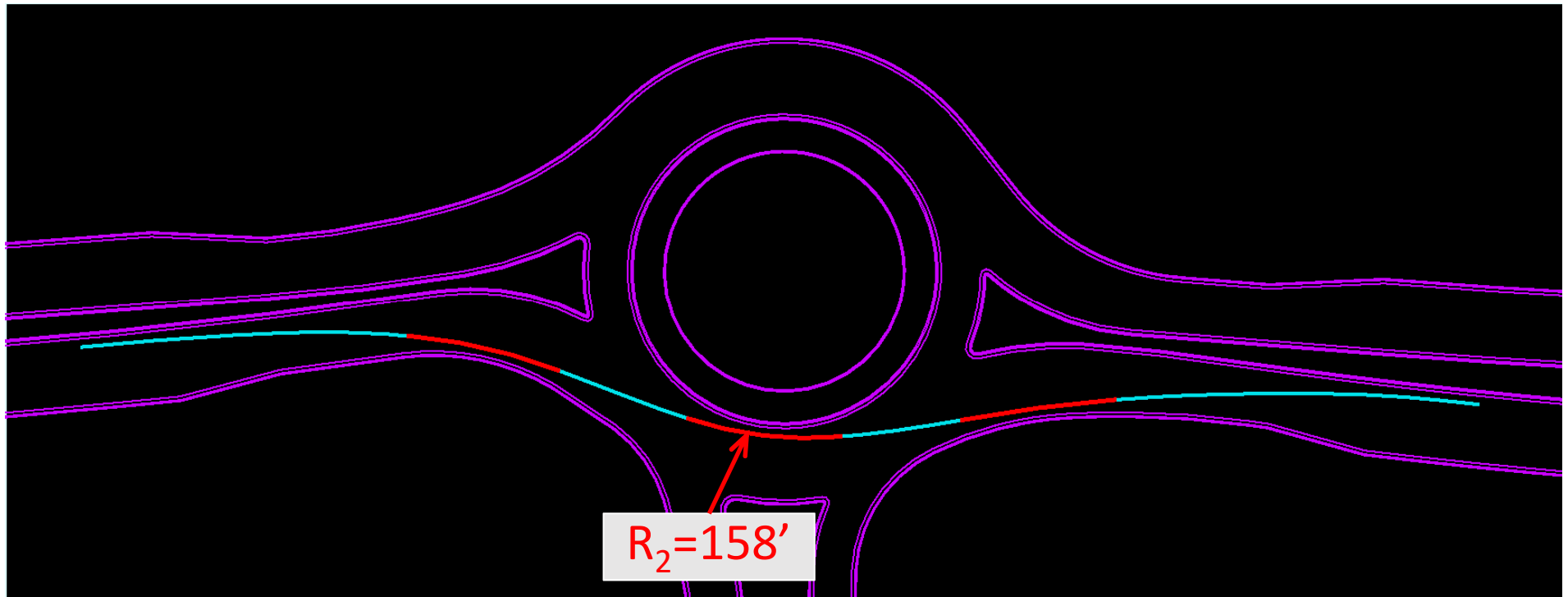


NCHRP 672 Exhibit 6-52

$$R_1 = 236' = 29 \text{ mph}$$

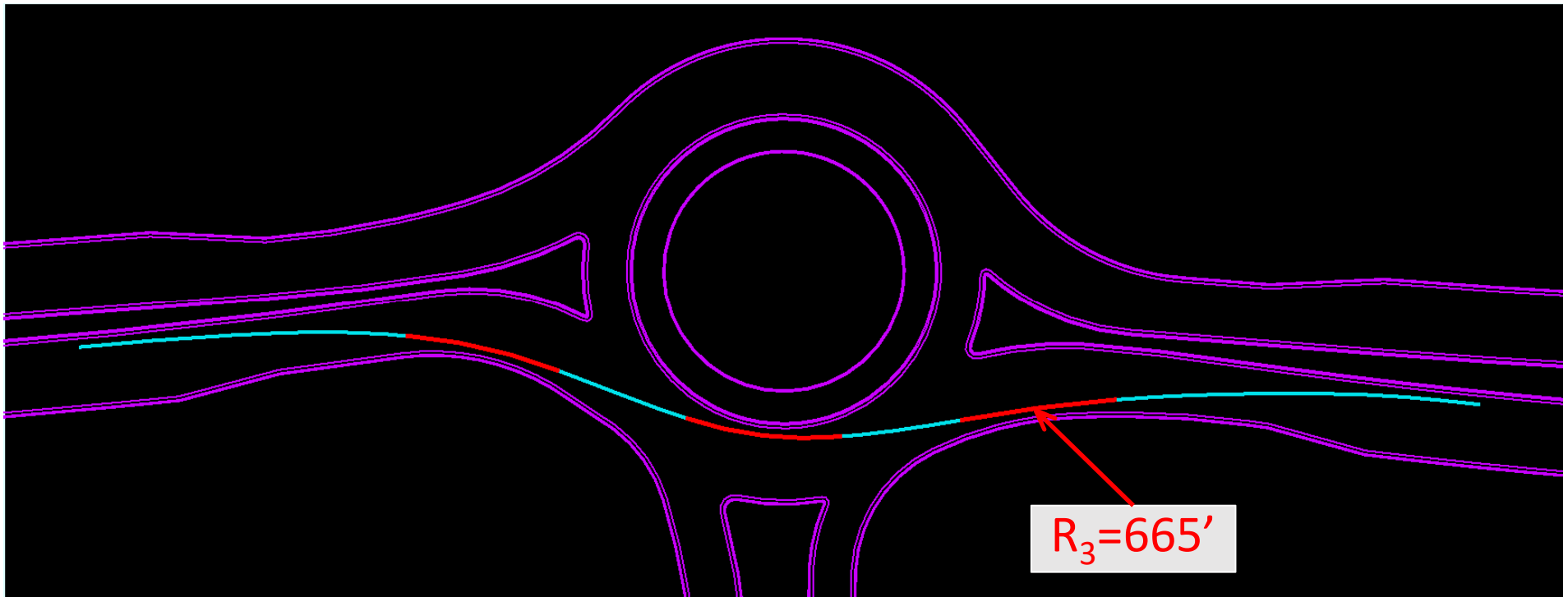
✓ < 30 mph for two-lane entry

Creating Through ($R_1 - R_3$) Fastest Paths



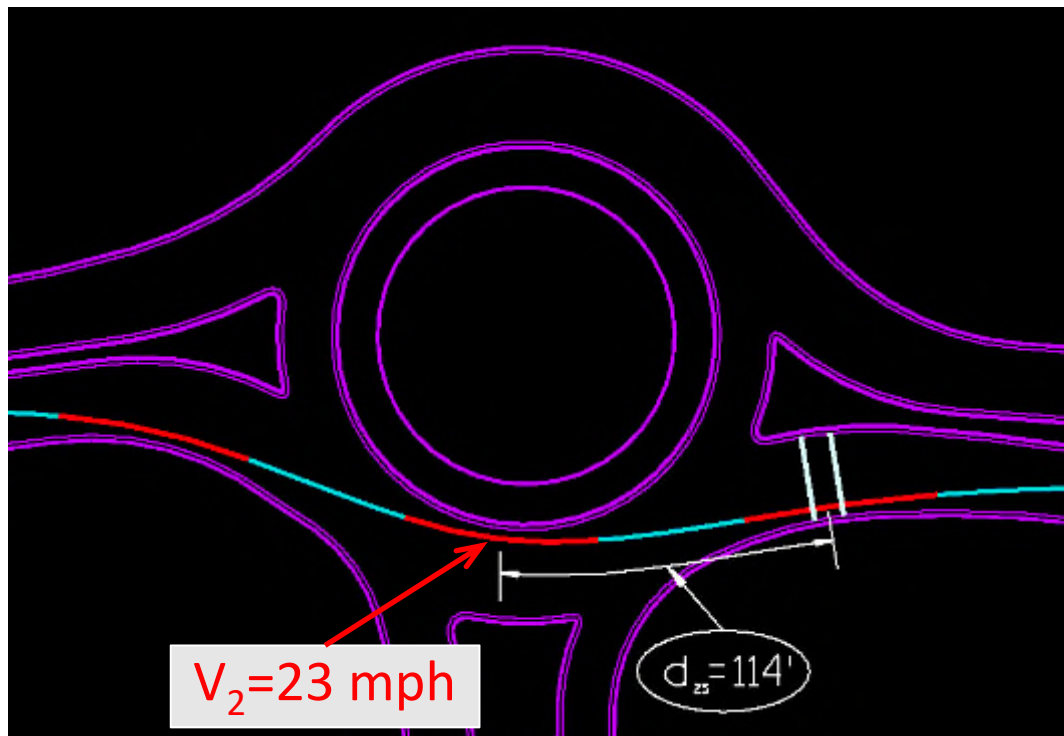
$$R_2 = 158' = 23 \text{ mph}$$

Creating Through ($R_1 - R_3$) Fastest Paths



$$R_3 = 665' = 43 \text{ mph}$$

Creating Through ($R_1 - R_3$) Fastest Paths



$$V_3 = \min \left\{ \begin{array}{l} V_{3\text{phase}} \\ \frac{1}{1.47} \sqrt{(1.47V_2)^2 + 2a_{23}d_{23}} \end{array} \right\}$$

$$V_2 = 23 \text{ mph}$$

$$a_{23} = 6.9 \text{ ft/s}^2$$

$$d_{23} = 114'$$

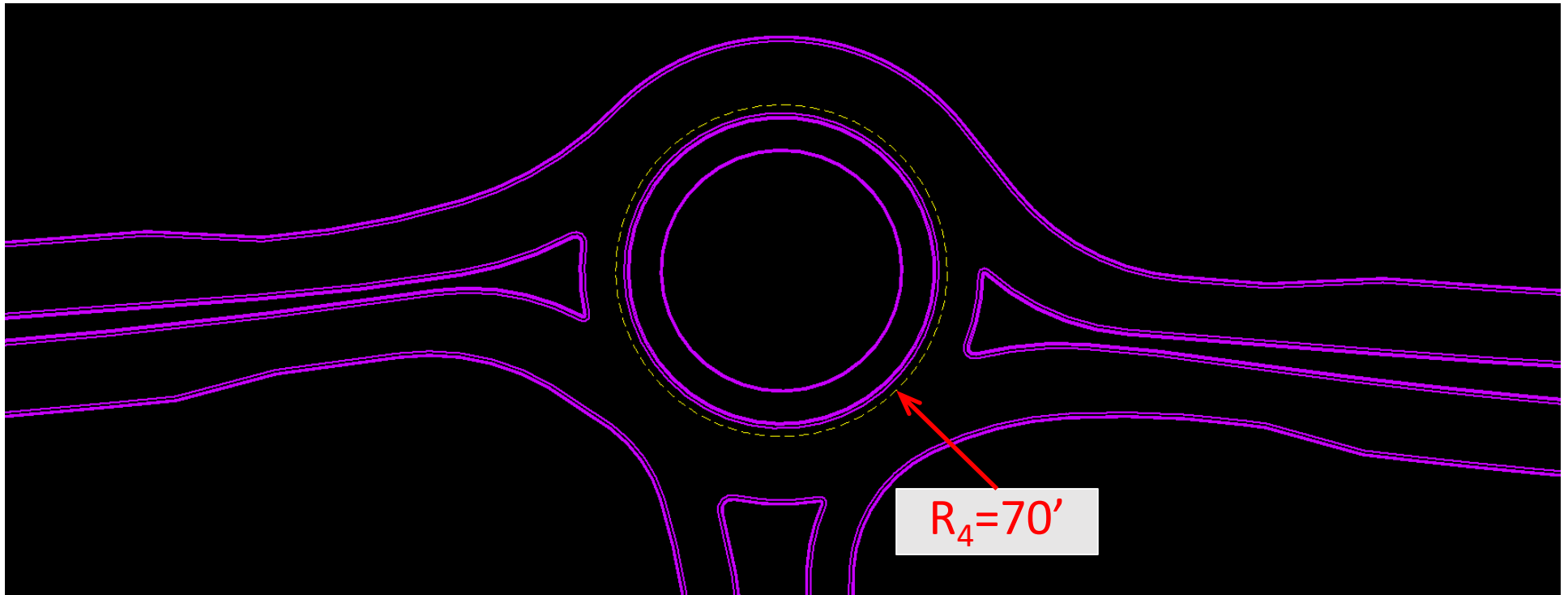
$$V_3 = 36 \text{ mph}$$

$$V_3 = 43 \text{ mph (measured)}$$

$$V_3 = 36 \text{ mph (calculated)}$$

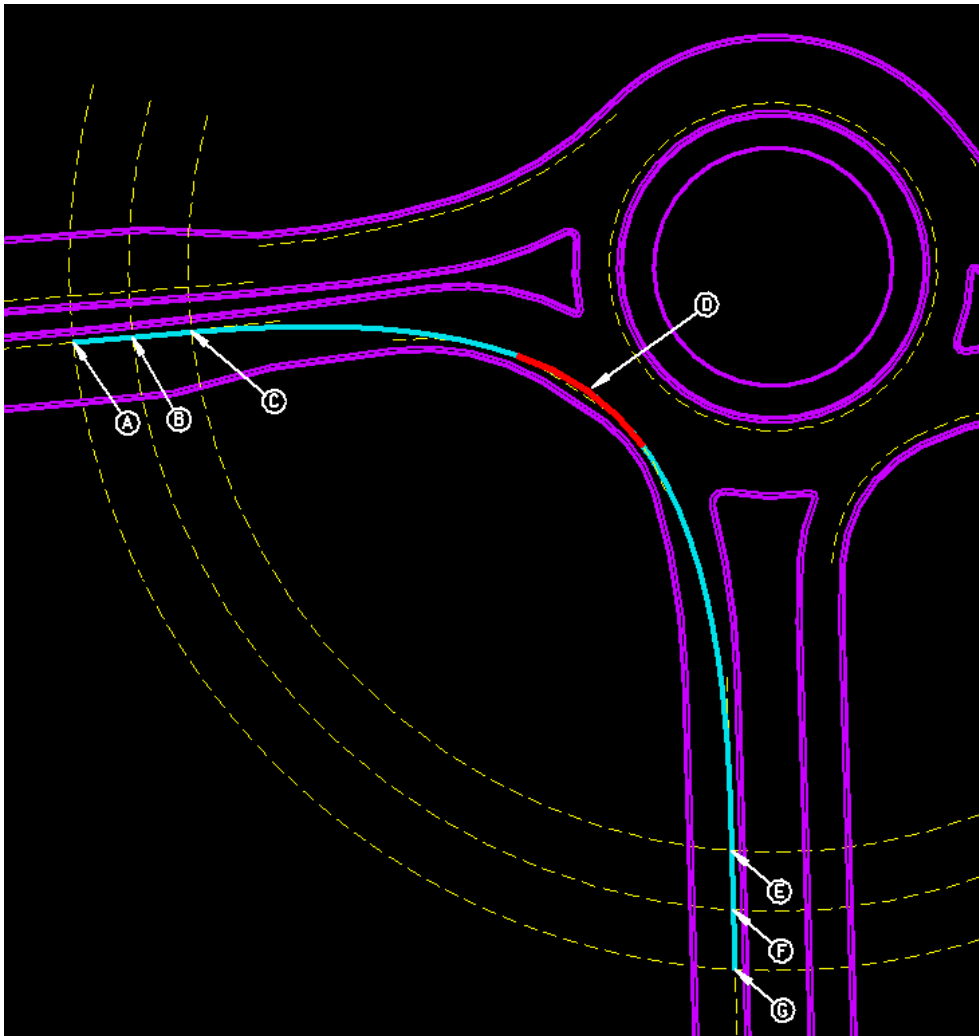
Creating Left Turn (R_4) Fastest Paths

- 1) Measure the radius of the central island curb offset



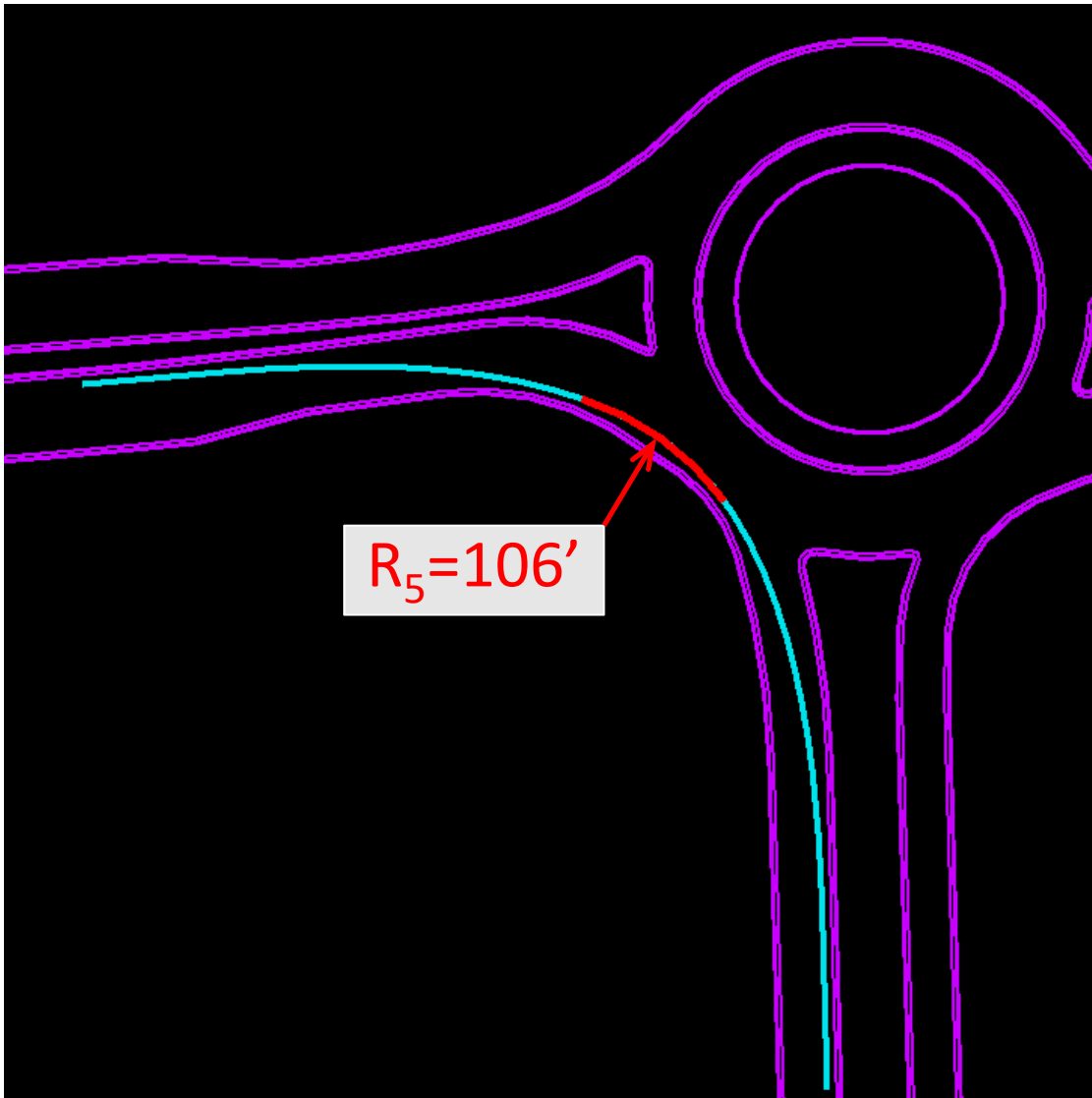
$$R_4 = 70' = 17 \text{ mph}$$

Creating Right Turn (R_5) Fastest Paths



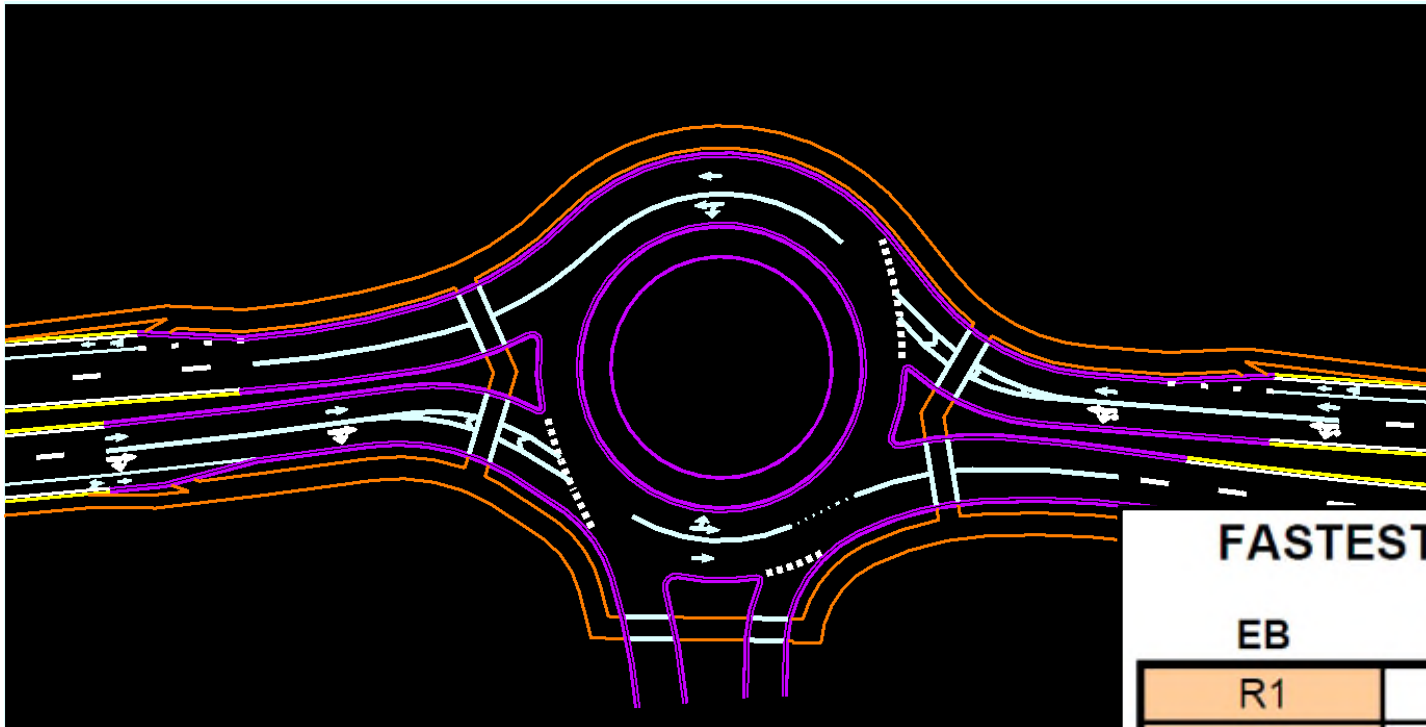
- 1) Create path offsets
- 2) Draw Spline Curve
 - A. Choose points A through G
- 3) Modify Spline Curve
 - A. Modify point D
 - B. Evaluate the entire spline to see if it looks like a path a vehicle would use
- 4) Place Arc
 - A. Smallest best-fit curves over 65' – 80'
- 5) Measure the radius

Creating Right Turn (R_5) Fastest Paths



$$R_5 = 106' = 21 \text{ mph}$$

Creating Fastest Paths



FASTEST SPEED PATHS

EB	Radius	MPH
R1	236	29
R2	158	23
R3	*	36
R4	70	17
R5	106	21

*Based on acceleration