















$$63 \text{ ft} = 5 \text{ sec}$$

$$P/EV = \frac{2.5 \text{ sec}}{7 \text{ sec}} \times 6615 = \underline{\underline{463}}$$

radius = 24

$$C = \text{Diameter} * \pi$$

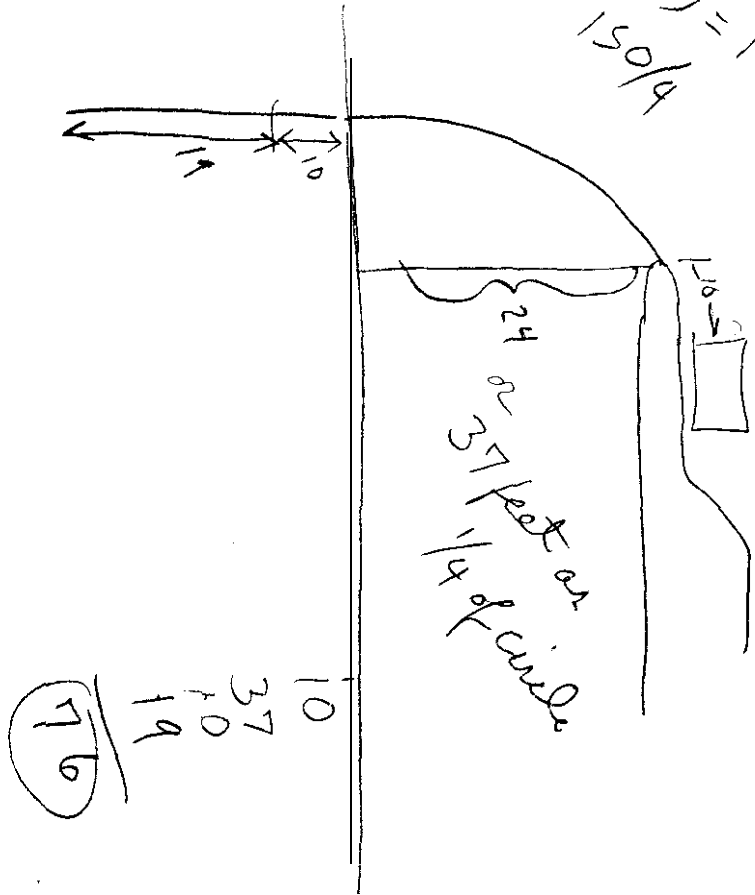
$$(48 * 3.14) = 150$$

$$150/4$$

$$24 * 2 = 48$$

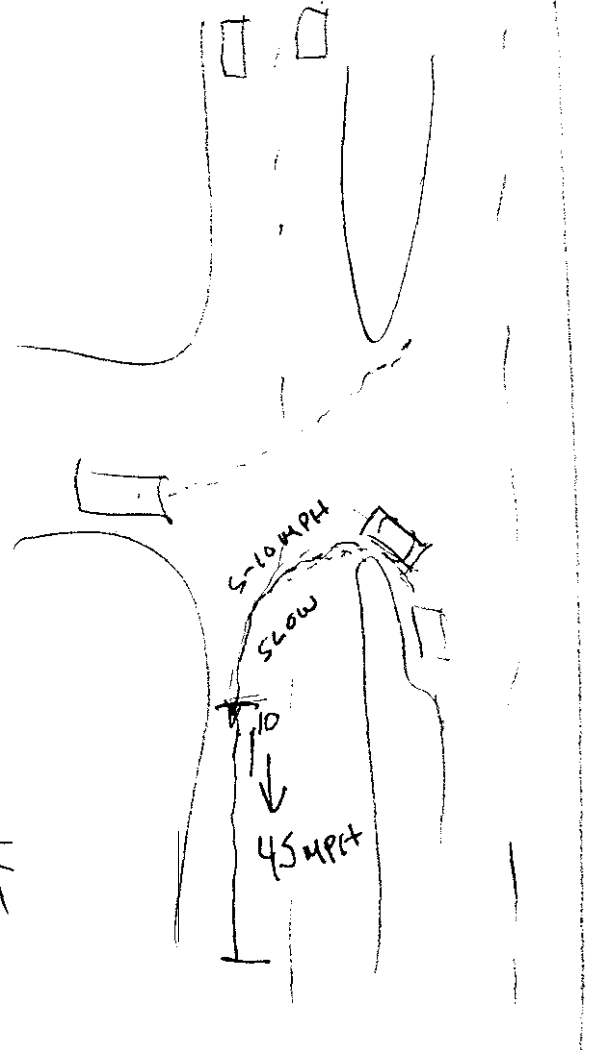
$$48 * \pi \approx 150$$

$$150/4 = 40$$

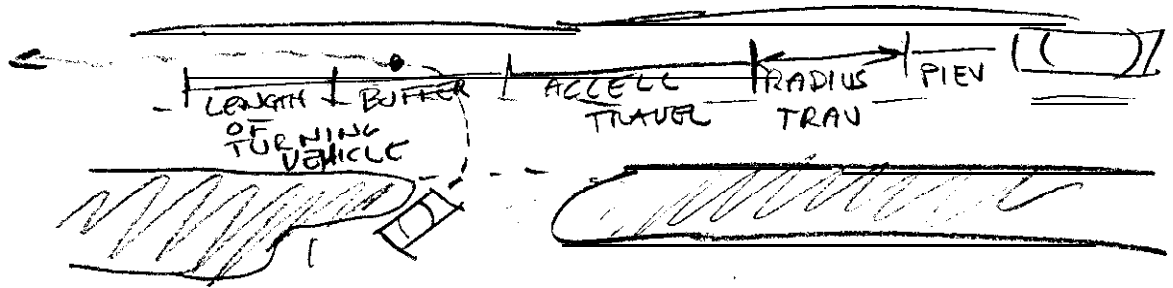


~~463~~

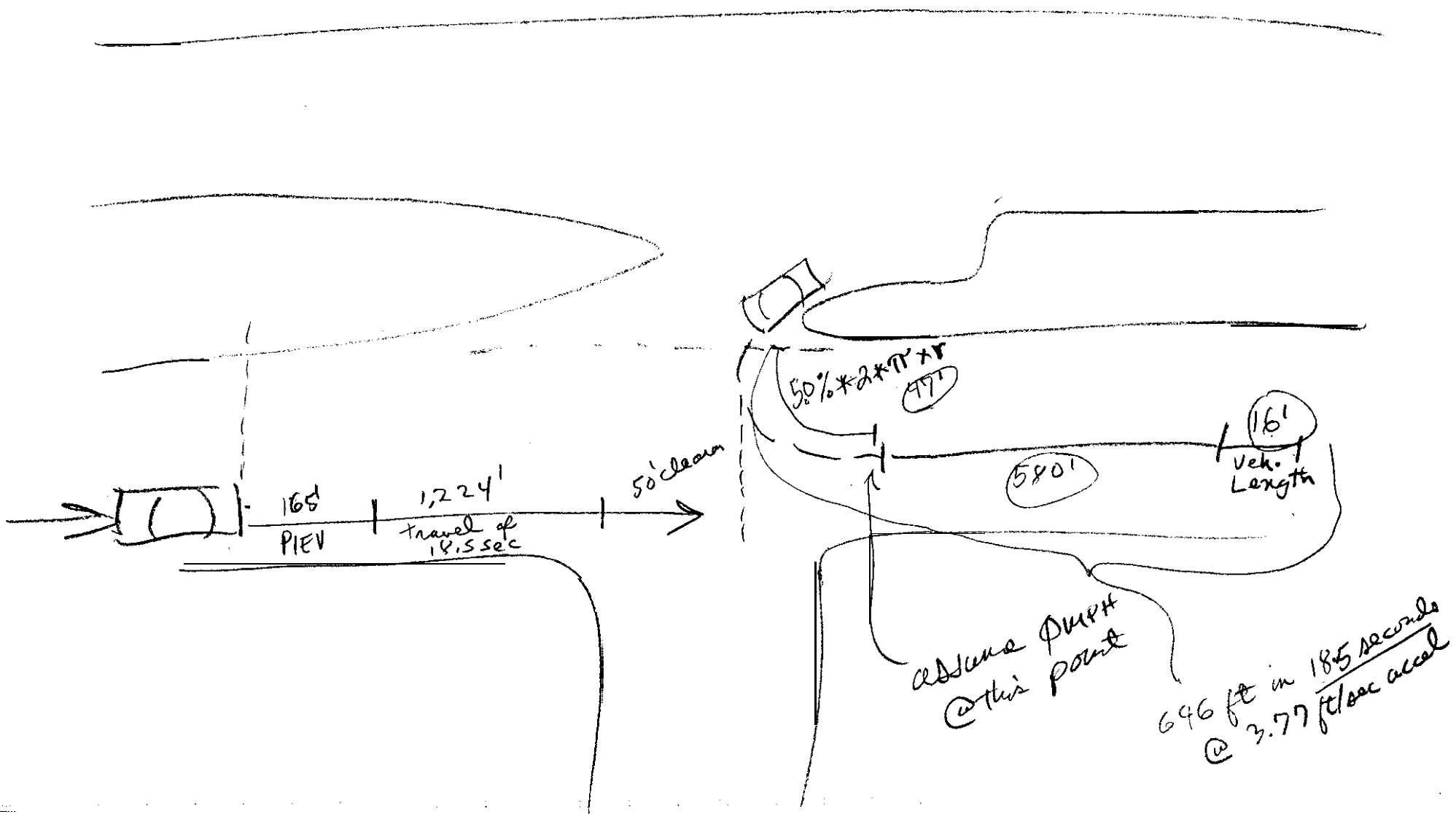
63 ft





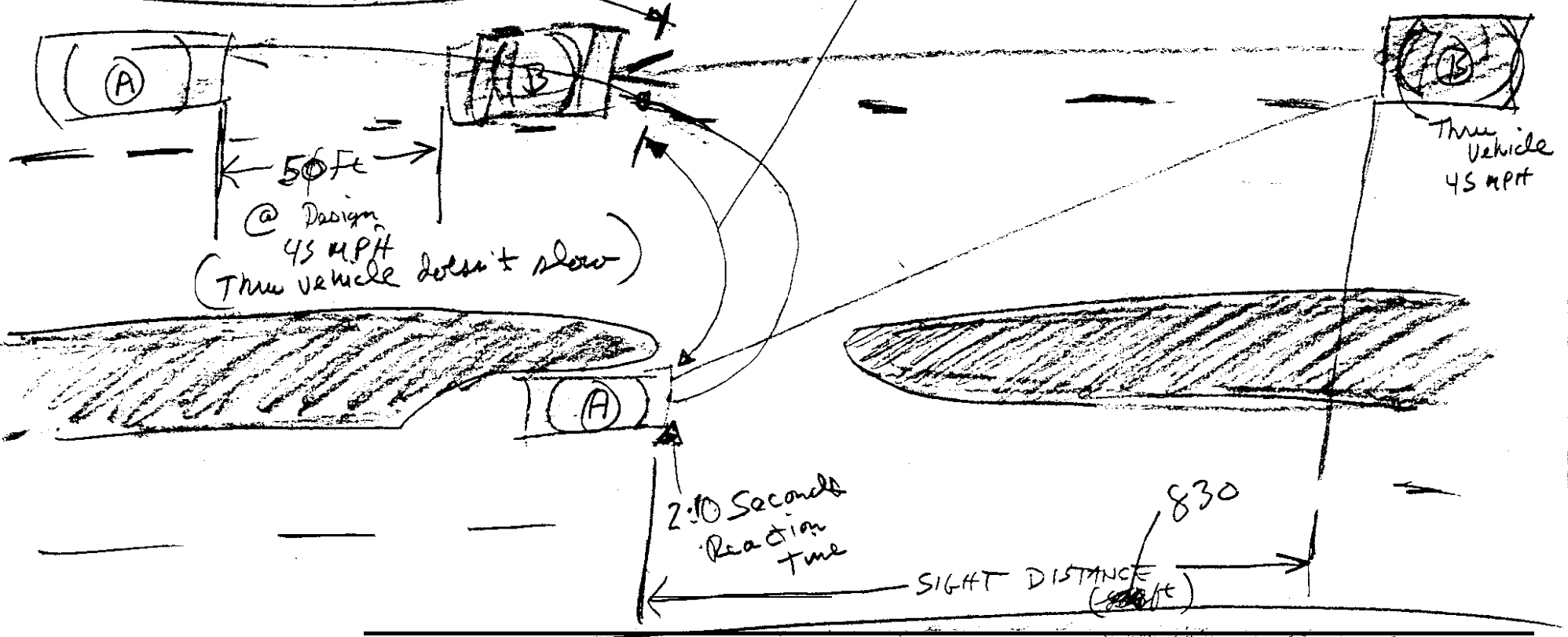


- ① Design speed 45 MPH \* 1.47 = 66 ft/sec
- ②  $PIEV = 2.5 \text{ SEC}$   
 $2.5 * 66.15 = 165 \text{ ft}$
- ③ DISTANCE THRU VEH travels during  
 Turn  $\uparrow \pi * \text{Radius (assume } \frac{1}{2} \text{ circle)}$
- ④ Distance thru vehicle travels during  
 turning vehicle accelerates to 45 MPH  
 580 ft (looked up from AASHTO)  
 Figure IX-34
- ⑤

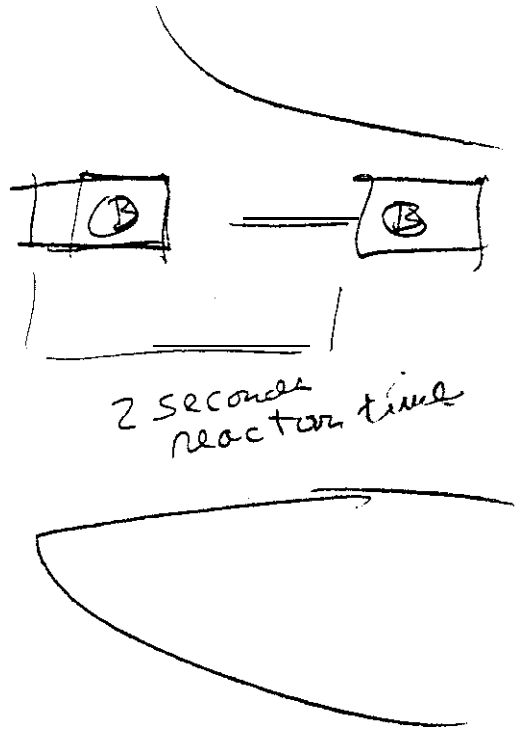
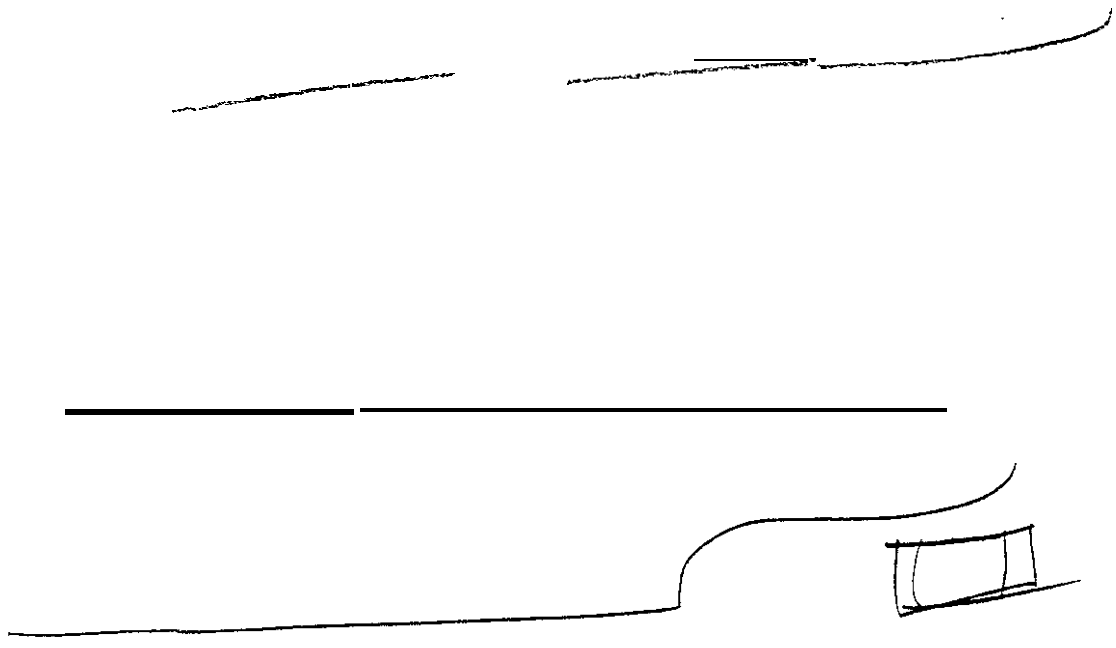


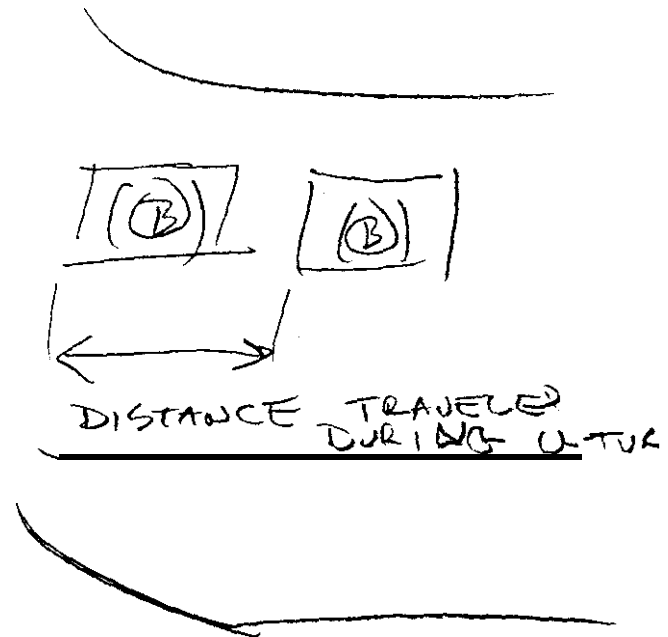
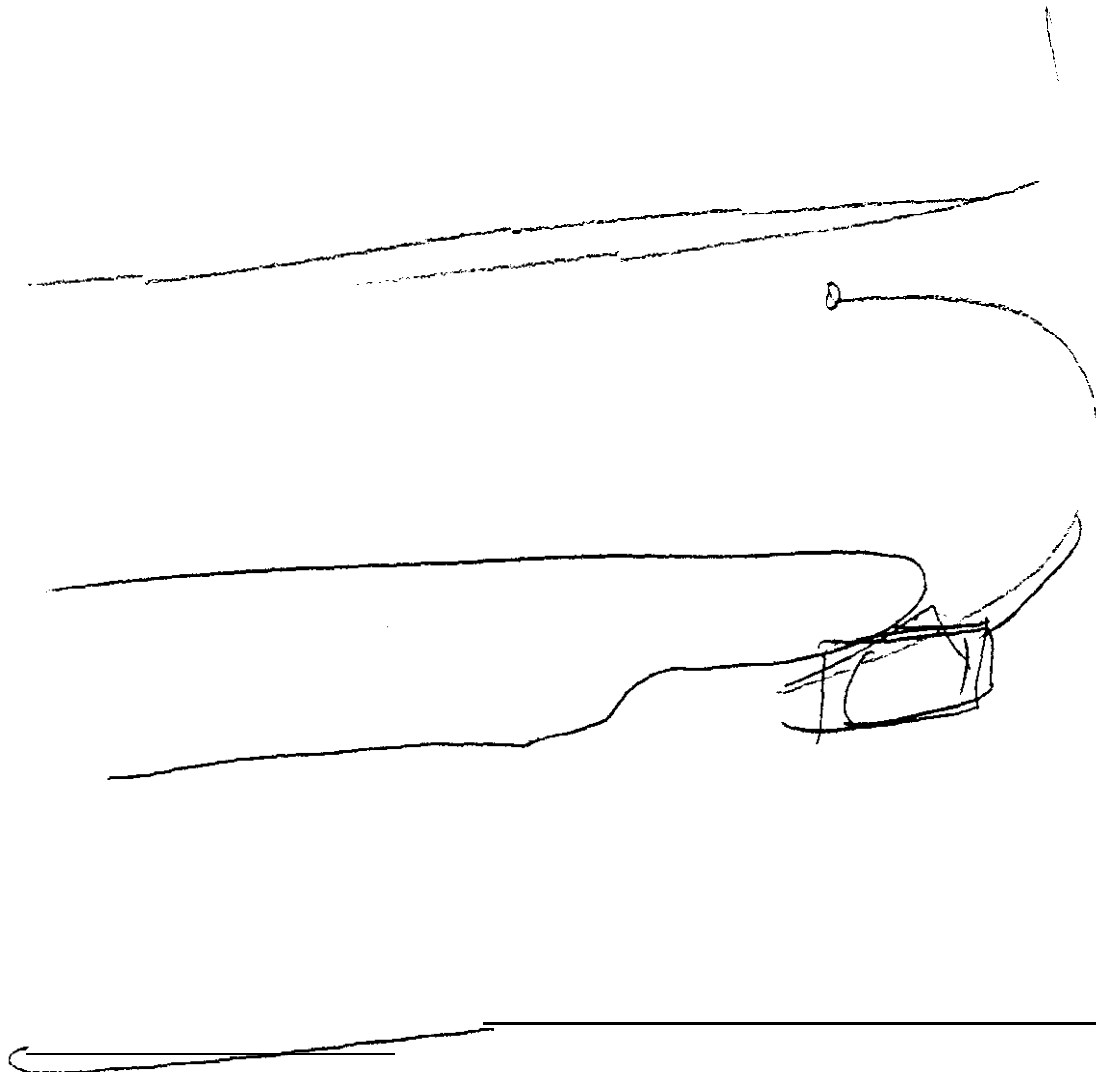
Distance for car A to  
accelerate to  
45 MPH from  $\phi$

Car A Time to  
travel distance  
of radius plus  
car length



U-TURN SIGHT DISTANCE  
EXAMPLE (45 MPH)

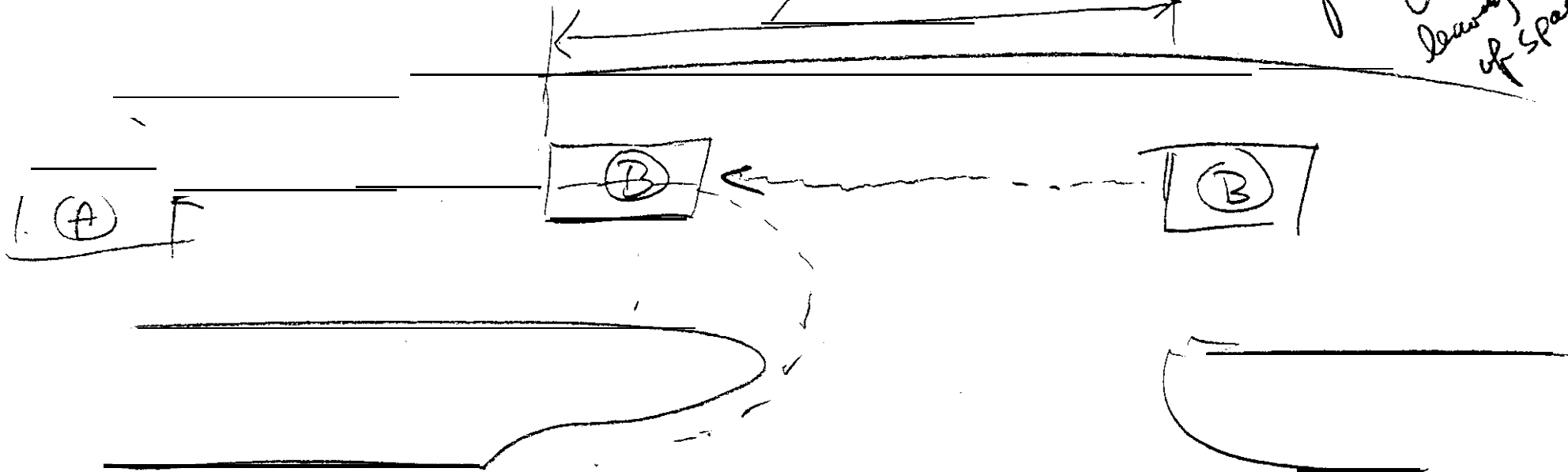




2

DISTANCE  
TRAVELED  
WHILE (A)

was accelerated  
to 45 MPH  
from end of  
U-Turn  
leaving soft  
of space



3

# Siaht Distance Worksheet for U Turns

## Inputs

Length of Vehicle 19 Ft  
 Radius of Turn Movement (inside) 15 Ft  
 Perception/Reaction Time (sec) 2 Seconds  
 Design Speed 45 Mph

$$(+FPS^2)/(2*DIST\_WHILE\_ACCE)$$

## outputs

### Turning Vehicle Data

Distance During U-Turn Portion

Acceleration Distance - From "Green Book" Figure IX-34 (pg 749; 1990 Edition)

Length of Vehicle

Total Travel during U-Turn Maneuver

Feet/Sec

66.15

$$1.47*MP$$

47 Pi \* Radius

580 Average Acceleration Rate of turner>>>>

19 Ft

646 Ft

3.77 Ft/sec

Time to Travel Total U-turn maneuver

Add Reaction **PIEV** Time

Total Reaction & U turn Maneuver time

18.51 Seconds

2 Seconds

21 Seconds

$$((UTURN\_DIST^2)/(ACCEL\_RATE))^0.5$$

### Thru Vehicle Data

Thru vehicle travels during Total Reaction and U-turn maneuver time

Add "Clearance" factor

1,357 Ft

50 Ft

1,407 Ft

$$\text{Total Reaction and U-turn Manuv. time} * FPS$$

### Sight Distance

Thru vehicle travels during Total Reaction and U-turn maneuver time+Clearance

Acceleration Distance - From "Green Book" Figure IX-34 (pg 749; 1990 Edition)

Sight Distance

1,407 Ft

560 Ft

827 Ft

# Siaht Distance Worksheet for U Turns

Seconds of Reaction Time

Speed	1	1.5	2	2.5	3	3.5	4
25	286	305	323	342	360	378	397
30	366	388	410	432	454	476	498
35	464	490	516	541	567	593	619
40	582	612	641	671	700	729	759
45	760	794	827	860	893	926	959
50	963	1,000	1,037	1,074	1,110	1,147	1,184
55	1,171	1,211	1,252	1,292	1,333	1,373	1,413
60	1,453	1,498	1,542	1,586	1,630	1,674	1,718
65	1,891	1,939	1,987	2,034	2,082	2,130	2,178
70	2,519	2,570	2,621	2,673	2,724	2,776	2,827

# Sight Distance Worksheet for U Turns

## Inputs

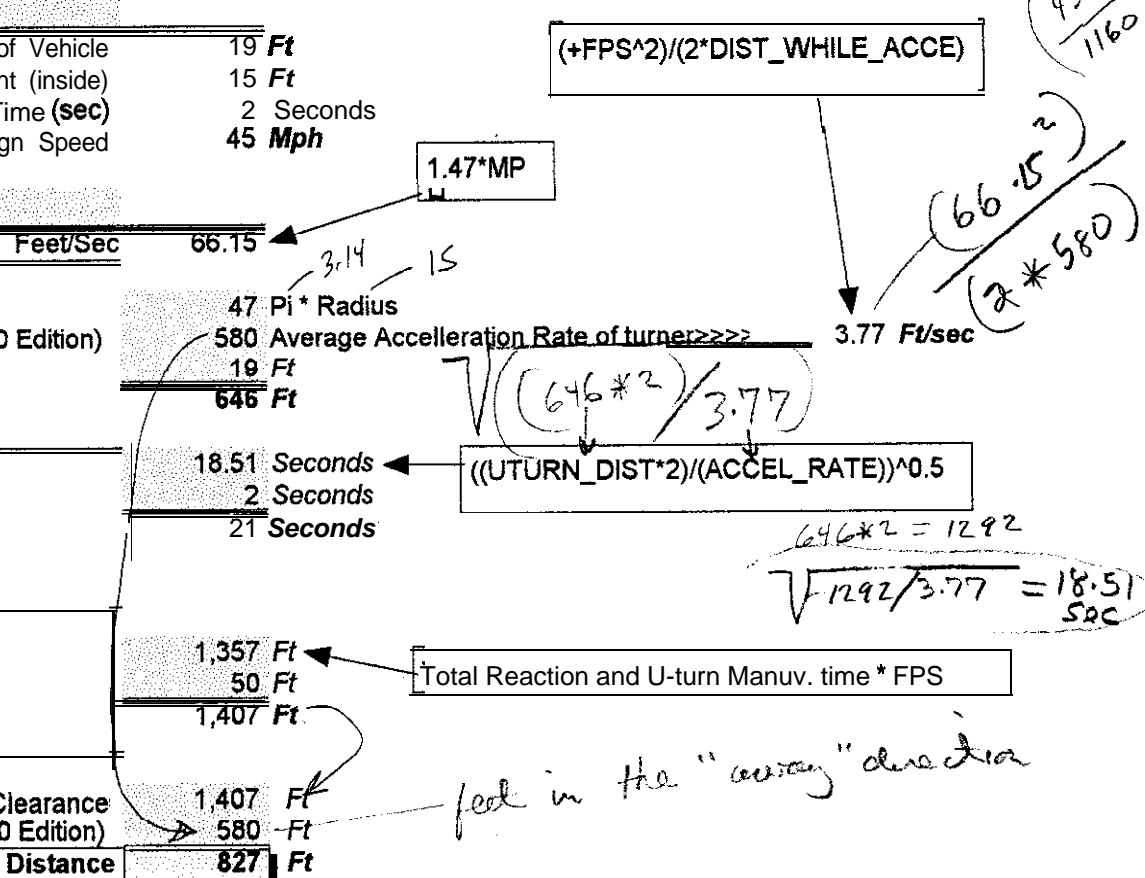
Length of Vehicle 19 Ft  
 Radius of Turn Movement (inside) 15 Ft  
 Perception/Reaction Time (sec) 2 Seconds  
 Design Speed 45 Mph

## Outputs

Turning Vehicle Data  
 Distance During U-Turn Motion  
 Acceleration Distance - From "Green Book" Figure IX-34 (pg 749; 1990 Edition)  
 Length of Vehicle  
 Total Travel during U-Turn *Maneuver to design speed*  
 Time to Travel Total U-turn maneuver  
 Add Reaction **PIEV** Time  
 Total Reaction & U turn Manuever time

Thru Vehicle Data  
 Thru vehicle travels during Total Reaction and U-turn maneuver time  
 Add "Clearance" factor

Sight Distance  
 Thru vehicle travels during Total Reaction and U-turn maneuver time + Clearance  
 Acceleration Distance - From "Green Book" Figure IX-34 (pg 749; 1990 Edition)  
**Sight Distance**



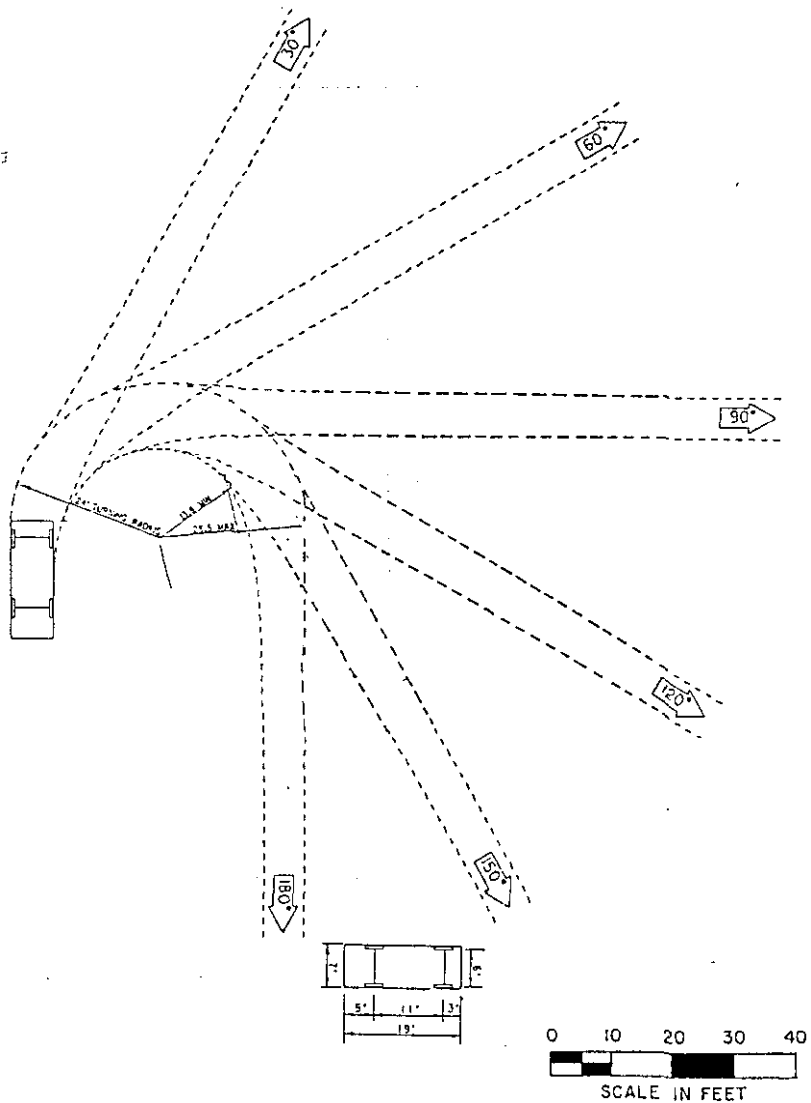
# Siaht Distance Worksheet for U Turns

Seconds of Reaction Time

	1	1.5	2	2.5	3	3.5	4
25	286	305	323	342	360	378	397
30	366	388	410	432	454	476	498
35	464	490	516	541	567	593	619
40	582	612	641	671	700	729	759
45	760	794	827	860	893	926	959
<b>50</b>	963	1,000	1,037	1,074	1,110	1,147	1,184
55	1,171	1,211	1,252	1,292	1,333	1,373	1,413
60	1,453	1,498	1,542	1,586	1,630	1,674	1,718
65	1,891	1,939	1,987	2,034	2,082	2,130	2,178
70	2,519	2,570	2,621	2,673	2,724	2,776	2,827



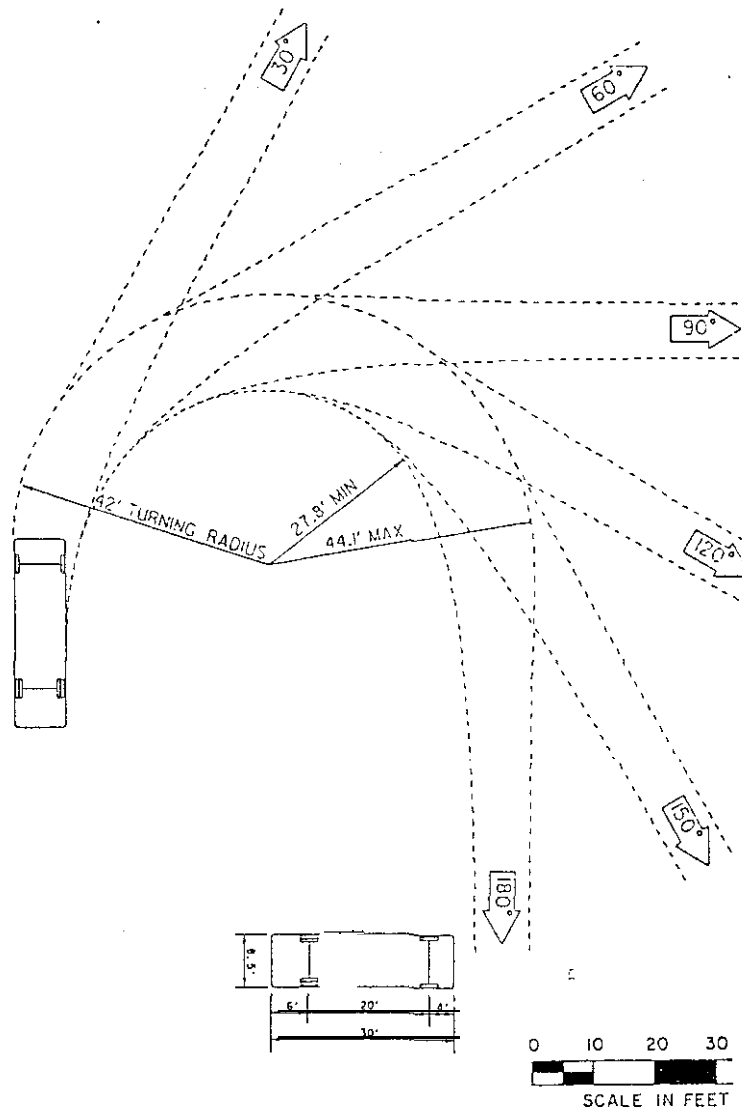
THIS TURNING TEMPLATE SHOWS THE TURNING PATHS OF THE AASHTO DESIGN VEHICLES. THE PATHS SHOWN ARE FOR THE LEFT FRONT OVERHANG AND THE OUTSIDE REAR WHEEL. THE LEFT FRONT WHEEL FOLLOWS THE CIRCULAR CURVE, HOWEVER, ITS PATH IS NOT SHOWN.



Source: Texas State Department of Highways and Public Transportation

Figure II-1. Minimum turning path for P design vehicle.

THIS TURNING TEMPLATE SHOWS THE TURNING PATHS OF THE AASHTO DESIGN VEHICLES. THE PATHS SHOWN ARE FOR THE LEFT FRONT OVERHANG AND THE OUTSIDE REAR WHEEL. THE LEFT FRONT WHEEL FOLLOWS THE CIRCULAR CURVE, HOWEVER, ITS PATH IS NOT SHOWN.



Source: Texas State Department of Highways and Public Transportation

Figure II-2. Minimum turning path for SU design vehicle.



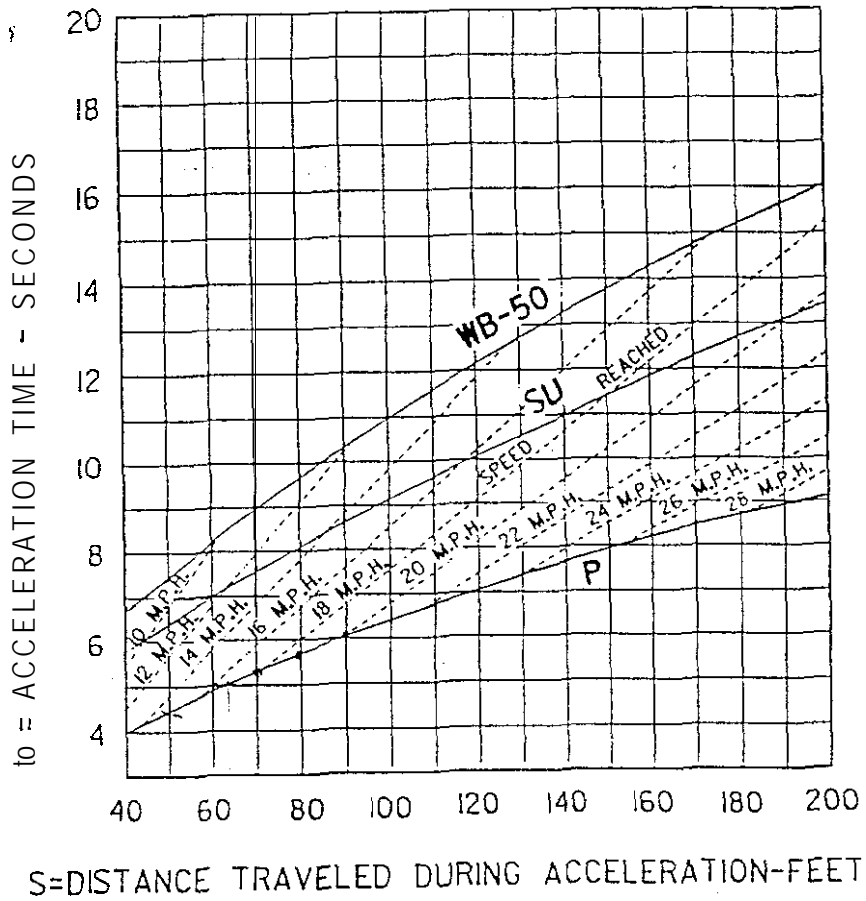


Figure IX-33. Sight distance at intersections (Case III, acceleration from stop).

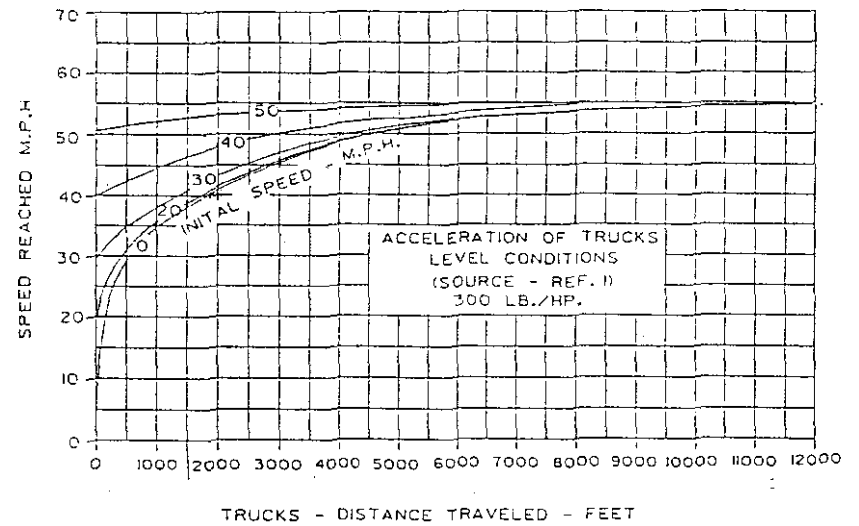
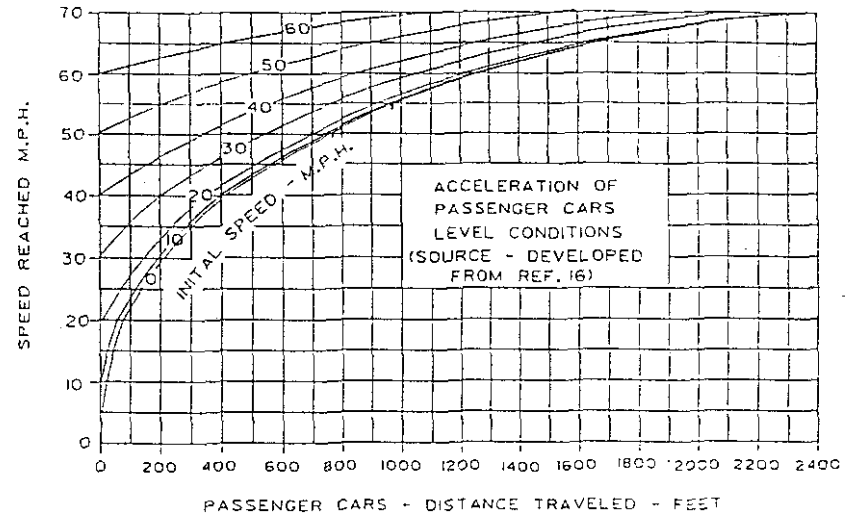


Figure IX-34. Acceleration curves.

(b)