

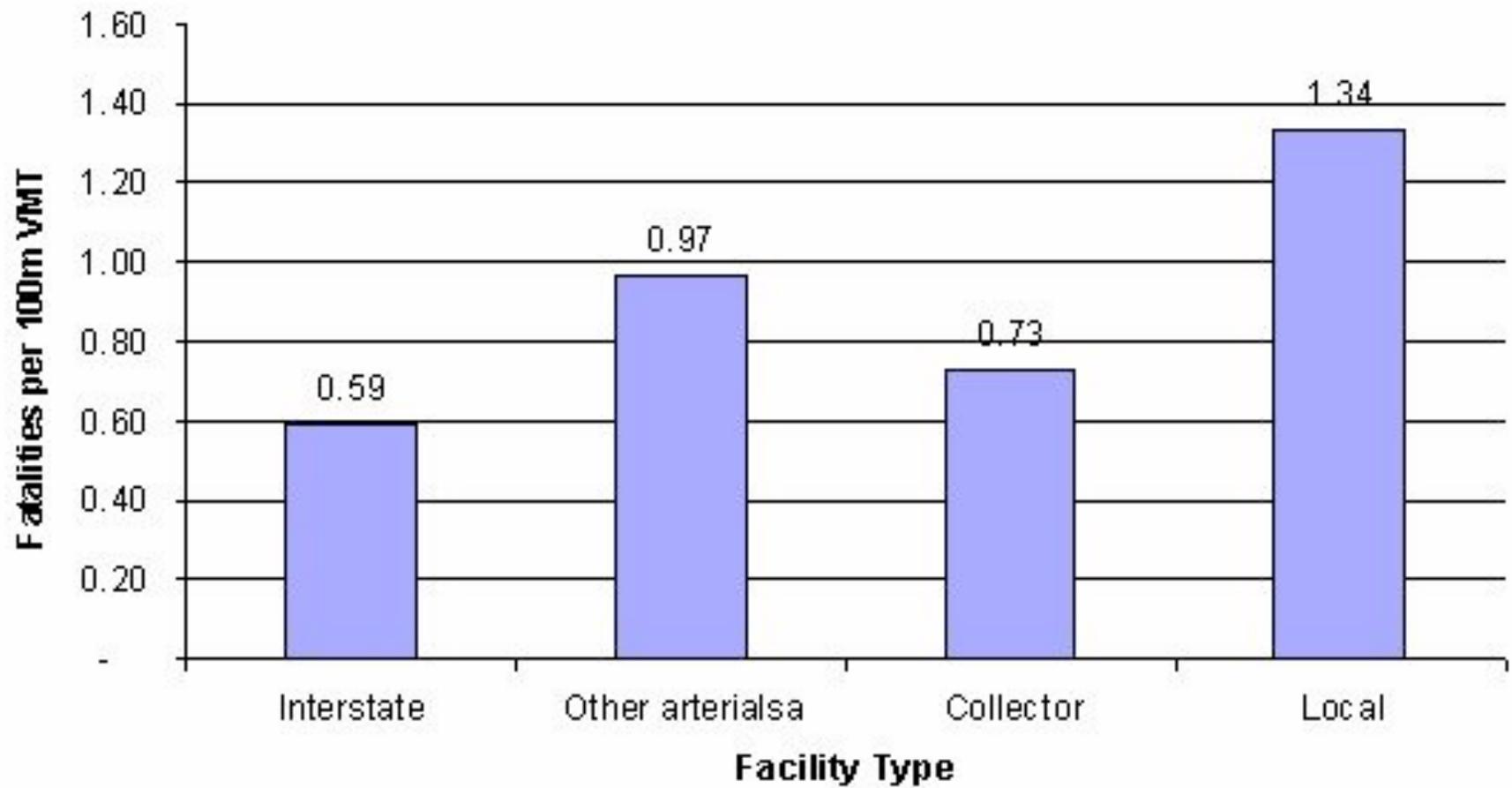
# STREETS AND PUBLIC SAFETY



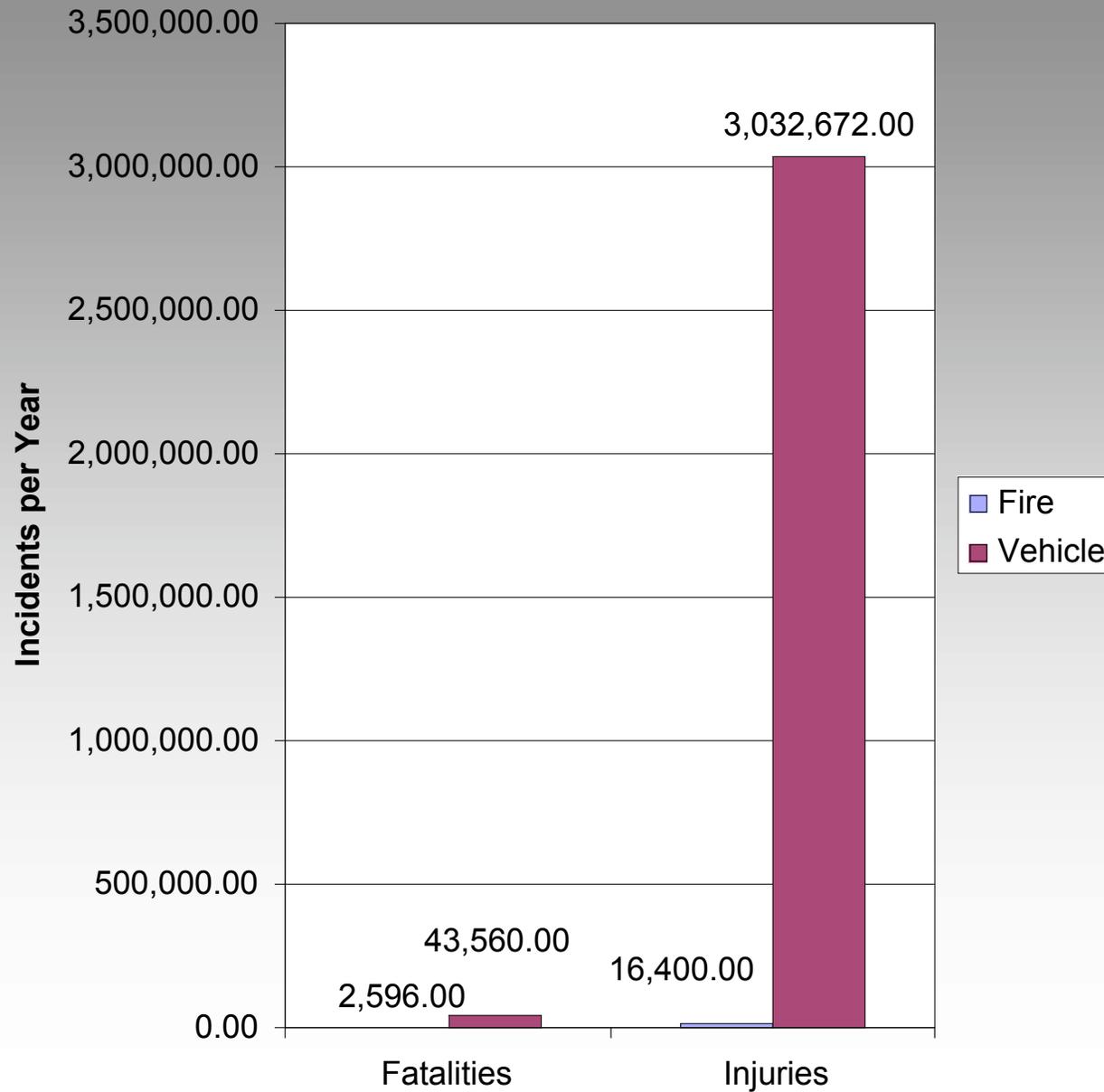
Peter Swift, PE

SwiftLLC.com

**Fatalities per Facility Type and VMT (2001 data)**



## Fire vs. Vehicle Injuries and Fatalities



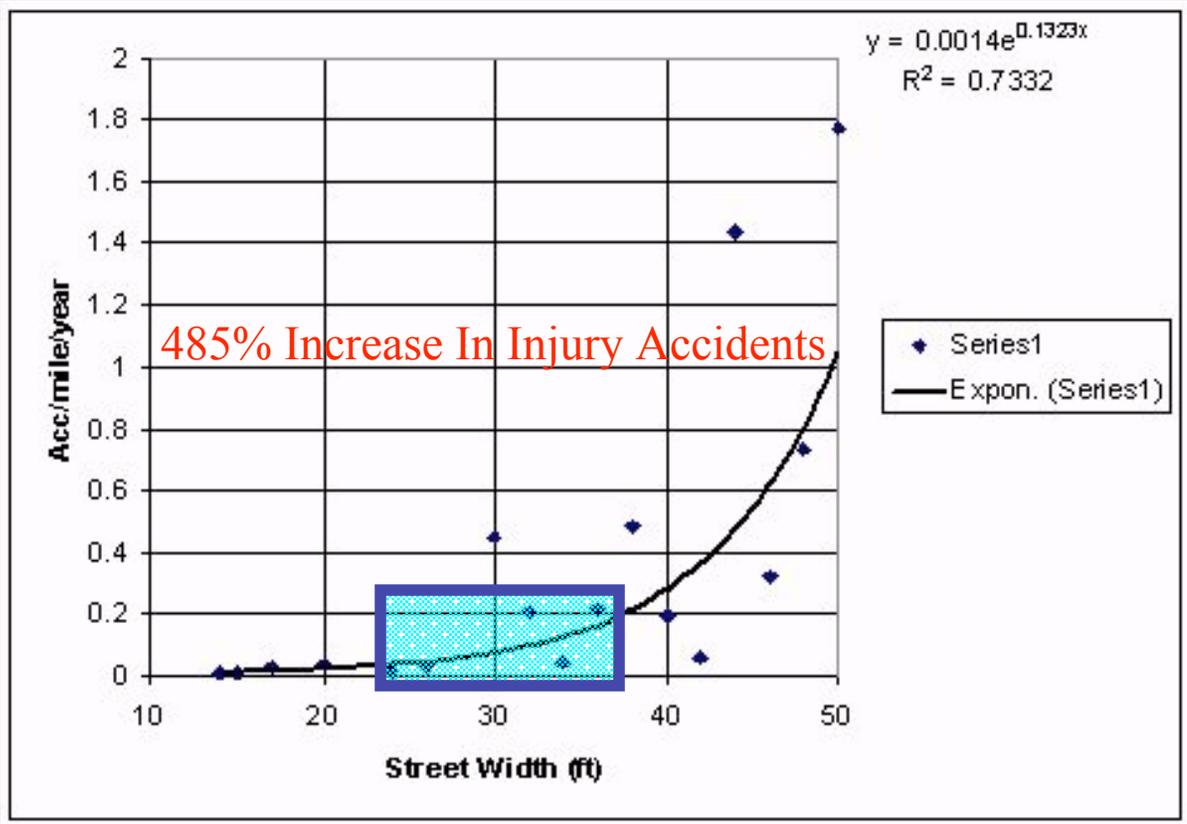
## Residential Street Typology and Injury Accident Frequency

### *Accidents excluded*

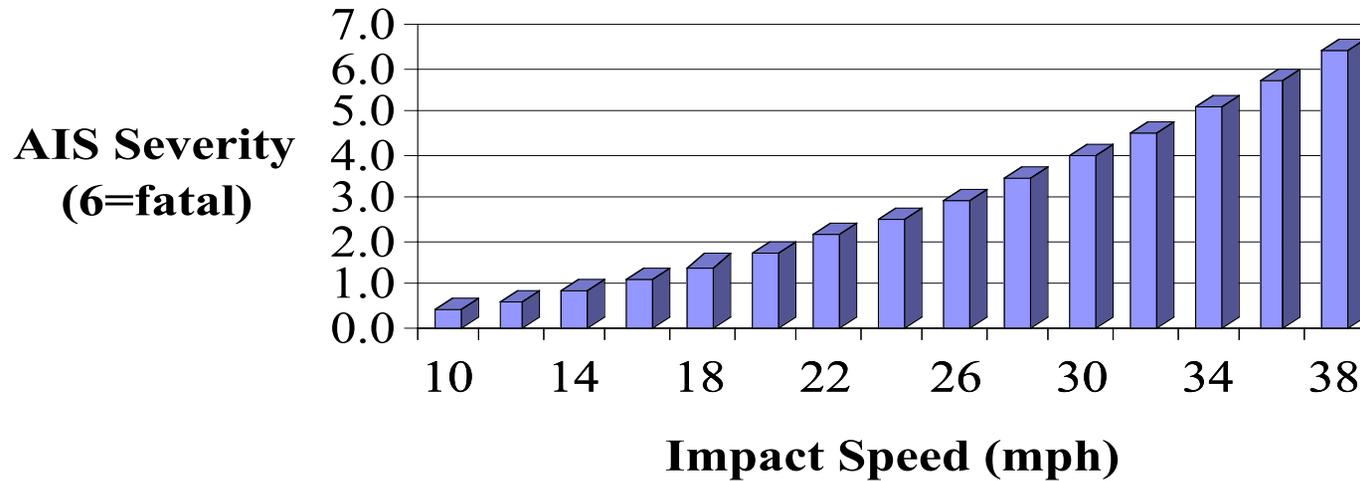
1. Road conditions that were wet, icy or snow covered
2. Substance abuse - Any notation of the driver being impaired or suspicion of being under the influence of any substance.
3. Traffic volume - accidents which occurred on any street other than a "local". A local street has less than 2,500 Average Daily Traffic (ADT).

Other criteria were that the accident must include at least one motorized vehicle and the accident produced a physical injury.

	<u>Characteristic</u>	<u>Normative Value</u>
1	Street Curves	Degree of curvature
2	Street width (curb face)	In 2' (60 cm) increments
3	Distance to nearest curb-cut	<20', 21'-50' or >50'
4	Curb type	modified, 6" (15cm) vertical or none
5	Tree density	Trees per 100 feet (28m) within 200 feet (55m) of the accident site
6	Traffic control	device distance from accident <20', 21-50', 51-100' or >100' <5.5m, 5.8-13.8m, 14-55m or >55m
7	ADT	Ave. annual vehicles per day
8	Sight distance	Clear or obstructed view
9	Parking Density	Vehicles per 100 feet (28m) parked within 200 feet (55m) of the accident site.
10	VMT	Vehicle miles traveled

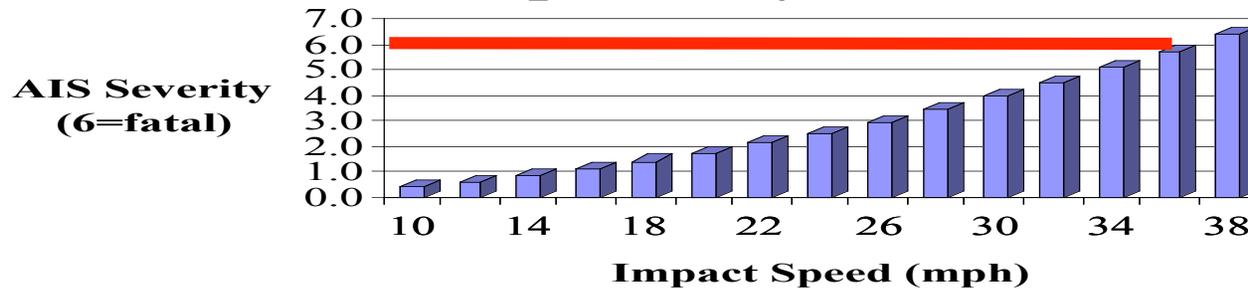


## Impact Speed vs. Pedestrian Injury (impact only)



Abbreviated Injury Severity

## Impact Speed vs. Pedestrian Injury (impact only)



1 Minor Superficial abrasion or laceration of skin; digit sprain; first-degree burn; head trauma with headache or dizziness (no other neurological signs).

2 Moderate Major abrasion or laceration of skin; cerebral concussion (unconscious less than 15 minutes); finger or toe crush/amputation; closed pelvic fracture with or without dislocation.

3 Serious Major nerve laceration; multiple rib fracture (but without flail chest); abdominal organ contusion; hand, foot, or arm crush/amputation.

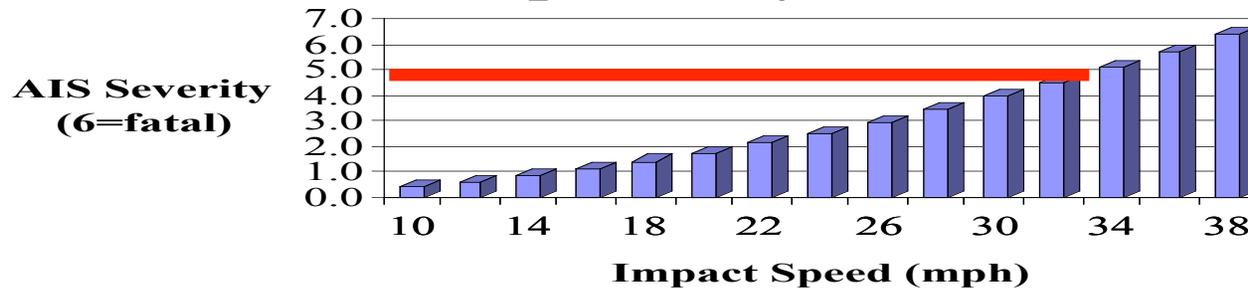
**36 mph; \$3,000,000**

**6 Fatal Injuries which although not fatal within the first 30 days after an accident, ultimately result in death .**

5 Critical Spinal cord injury (with cord transection); extensive second- or third-degree burns; cerebral concussion with severe neurological signs (unconscious more than 24 hours).

4 Severe Spleen rupture; leg crush; chest-wall perforation; cerebral concussion with other neurological signs (unconscious less than 24 hours).

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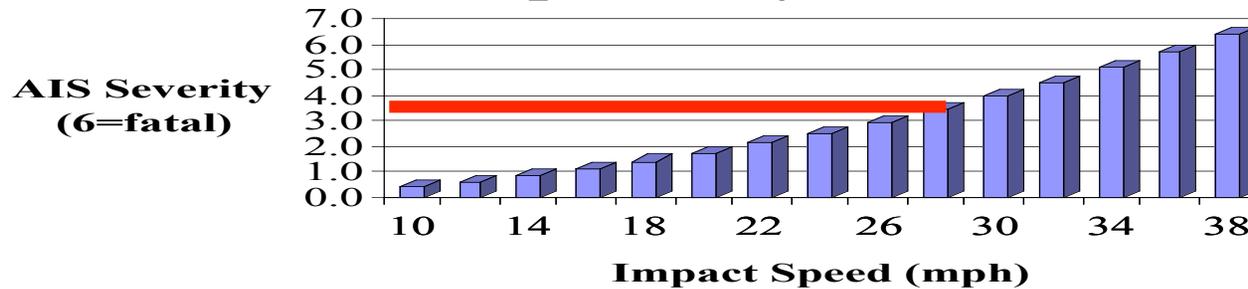
6 Fatal Injuries which although not fatal within the first 30 days after an accident, ultimately result in death .

**33 mph; \$2,287,500**

**5 Critical Spinal cord injury (with cord transection); extensive second-or third-degree burns; cerebral concussion with severe neurological signs (unconscious more than 24 hours).**

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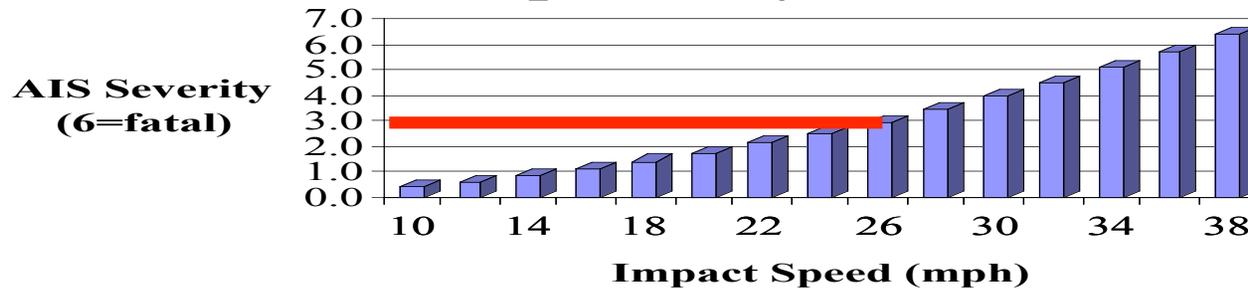
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5 Critical Spinal cord injury (with cord transection); extensive second- or third-degree burns; cerebral concussion with severe neurological signs (unconscious more than 24 hours).

**28 mph; \$562,500**

**4 Severe Spleen rupture; leg crush; chest-wall perforation; cerebral concussion with other neurological signs (unconscious less than 24 hours).**

## Impact Speed vs. Pedestrian Injury (impact only)



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2 Moderate Major abrasion or laceration of skin; cerebral concussion (unconscious less than 15 minutes); finger or toe crush/amputation; closed pelvic fracture with or without dislocation.

26 mph; \$172,500

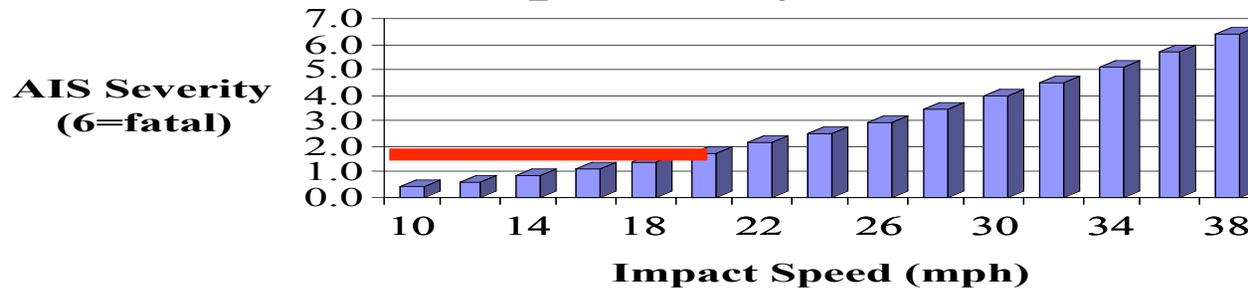
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## Impact Speed vs. Pedestrian Injury (impact only)



1 Minor Superficial abrasion or laceration of skin; digit sprain; first-degree burn; head trauma with headache or dizziness (no other neurological signs).

**20 mph; \$46,500**

2 Moderate Major abrasion or laceration of skin; cerebral concussion (unconscious less than 15 minutes); finger or toe crush/amputation; closed pelvic fracture with or without dislocation.

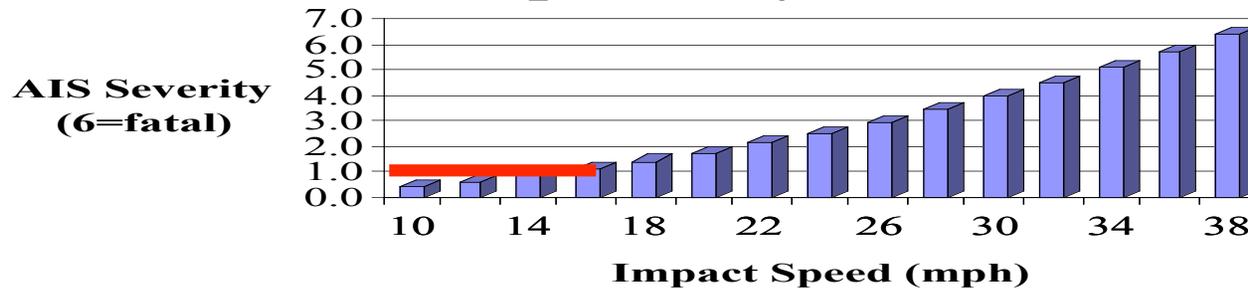
3 Serious Major nerve laceration; multiple rib fracture (but without flail chest); abdominal organ contusion; hand, foot, or arm crush/amputation.

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5 Critical Spinal cord injury (with cord transection); extensive second- or third-degree burns; cerebral concussion with severe neurological signs (unconscious more than 24 hours).

4 Severe Spleen rupture; leg crush; chest-wall perforation; cerebral concussion with other neurological signs (unconscious less than 24 hours).

## Impact Speed vs. Pedestrian Injury (impact only)



16 mph; \$6,000

1 Minor Superficial abrasion or laceration of skin; digit sprain; first-degree burn; head trauma with headache or dizziness (no other neurological signs).

2 Moderate Major abrasion or laceration of skin; cerebral concussion (unconscious less than 15 minutes); finger or toe crush/amputation; closed pelvic fracture with or without dislocation.

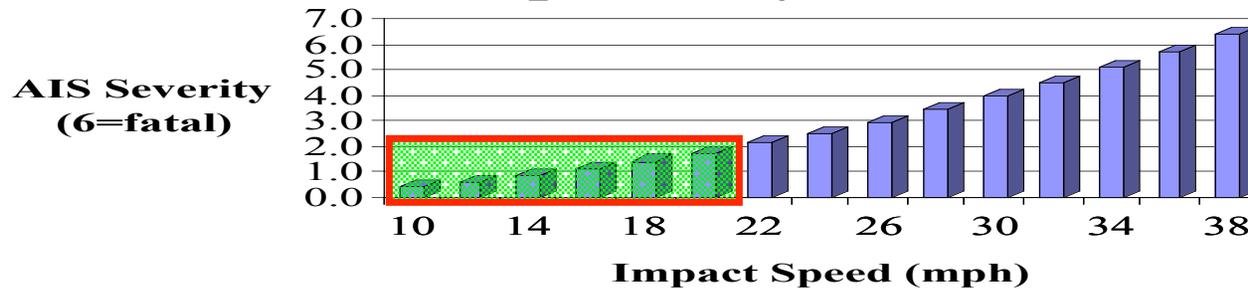
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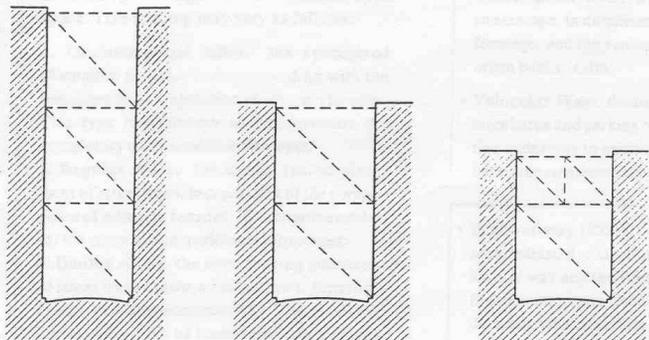
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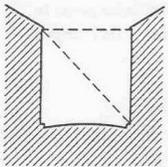
### Spatial Definition by Height-to-Width Ratio



3:1

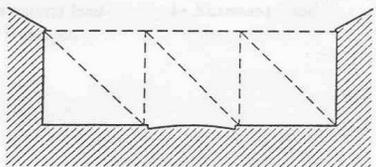
2:1

1.5:1



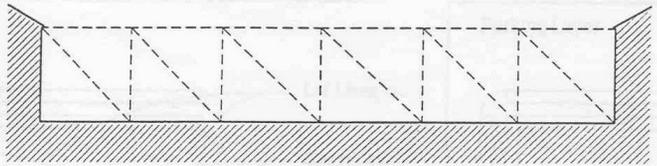
1:1

The best for thoroughfares



1:3

The best for squares

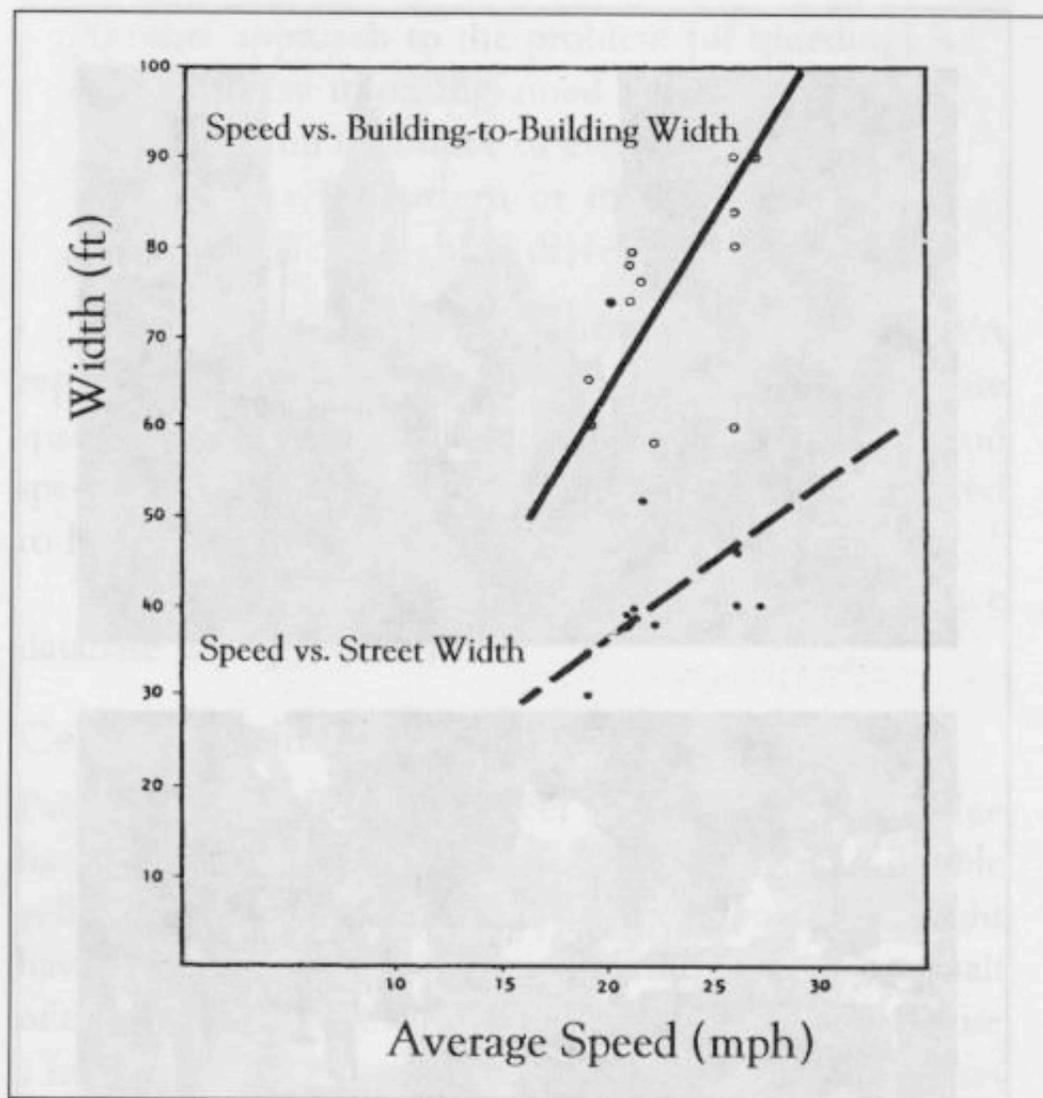


1:6

The perceivable maximum



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Period Square	Mixed Square	Axis Square	Decor Axis Square	Circle Square	Overhead Circle Square	Forward Square	Over/Circle	Hexagon Square	Gate	Gate	The Plaza	Curved/Plaza	Polygons	Overhead Square



**Figure 5.51. Speed versus Pavement Width and Pavement Width Plus Setbacks.**

Source: D.T. Smith and D. Appleyard, *Improving the Residential Street Environment—Final Report*, Federal Highway Administration, Washington, DC, 1981, p. 127.

**ACCIDENT SEVERITY AND INJURY  
Must be reduced by controlling  
Vehicular speed.**



# FIRE OPERATIONS



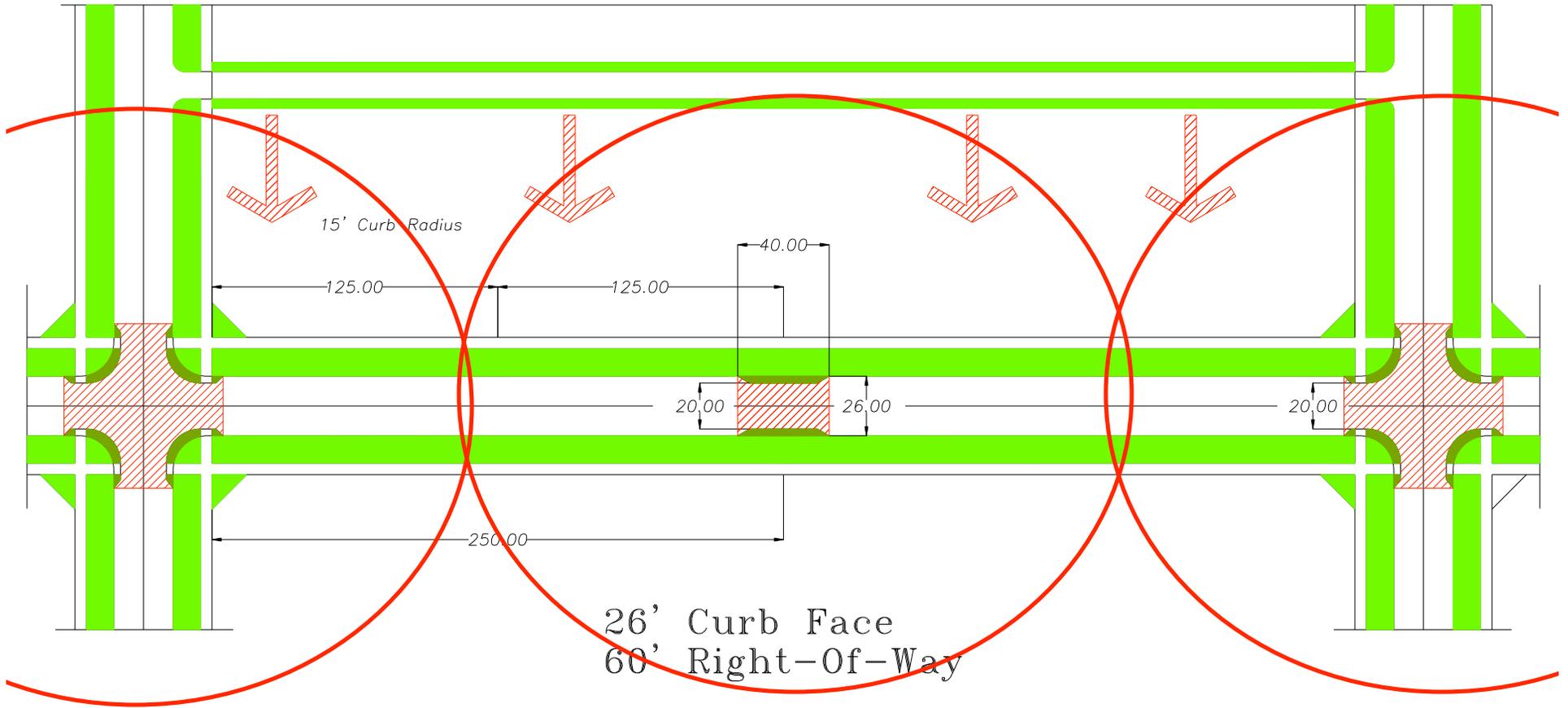














Parking Density **MUST** be evaluated

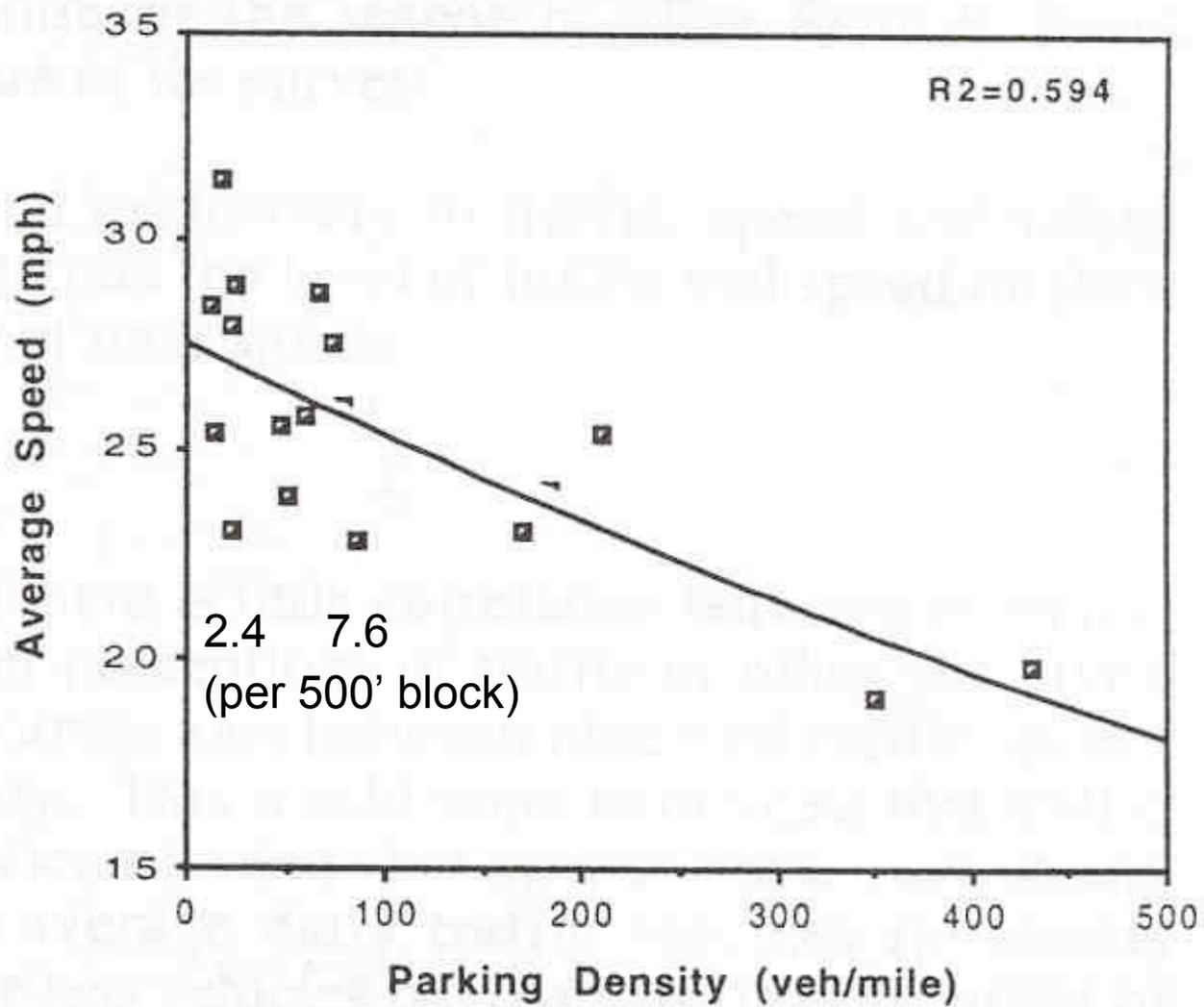
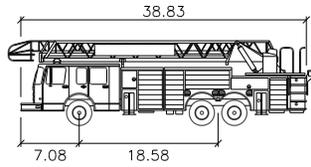
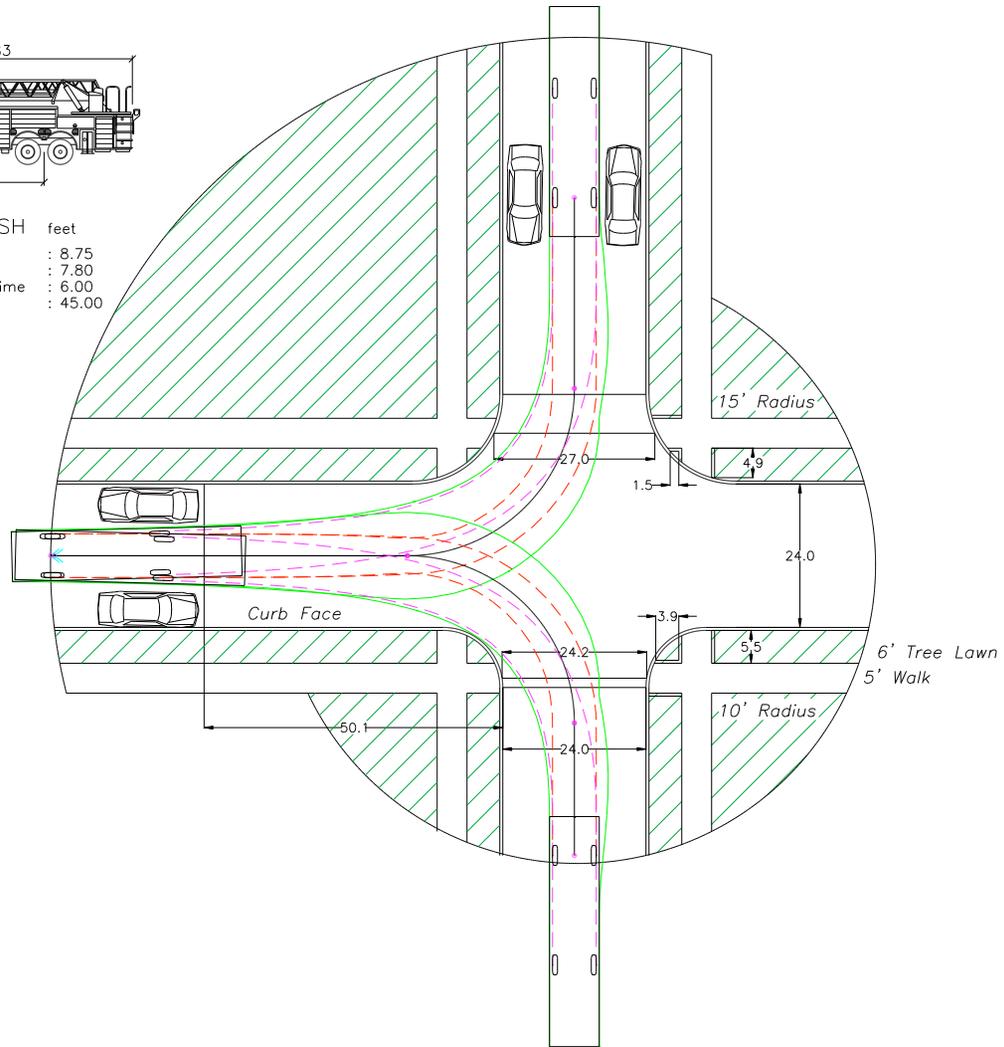


Figure 2. Average Speed vs. On-Street Parking D

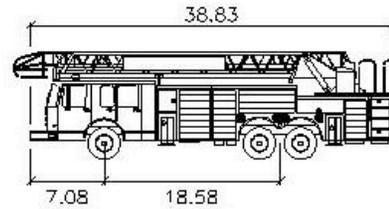
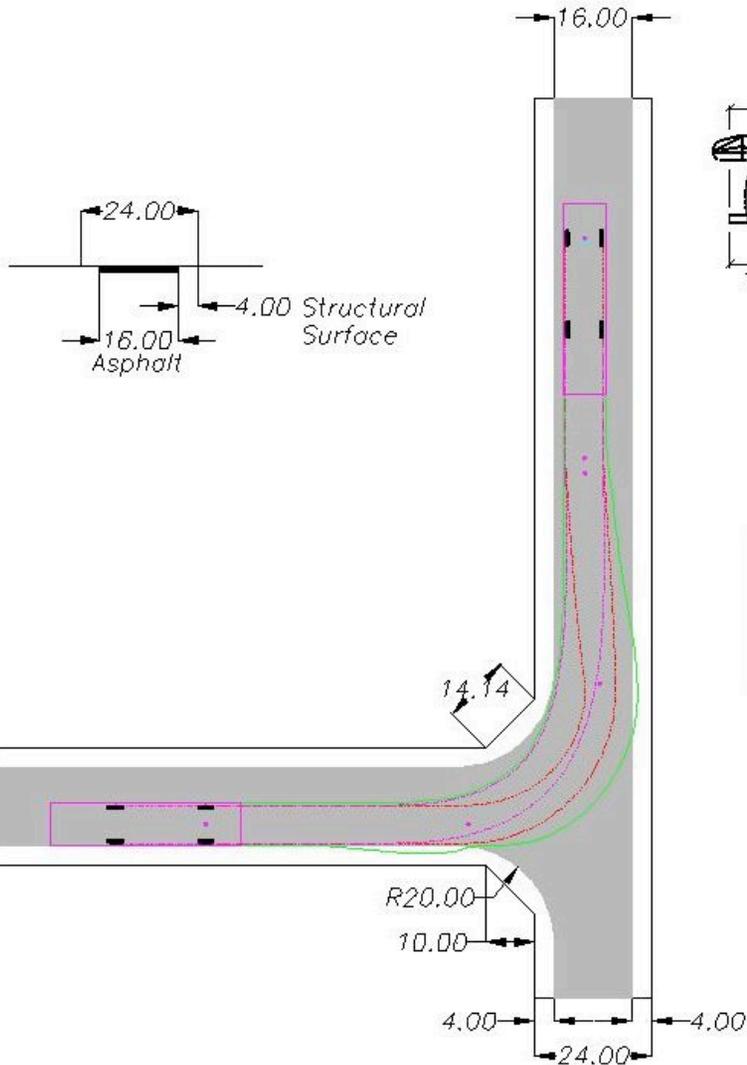




PIERCE-DASH feet  
 Width : 8.75  
 Track : 7.80  
 Lock to Lock Time : 6.00  
 Steering Angle : 45.00



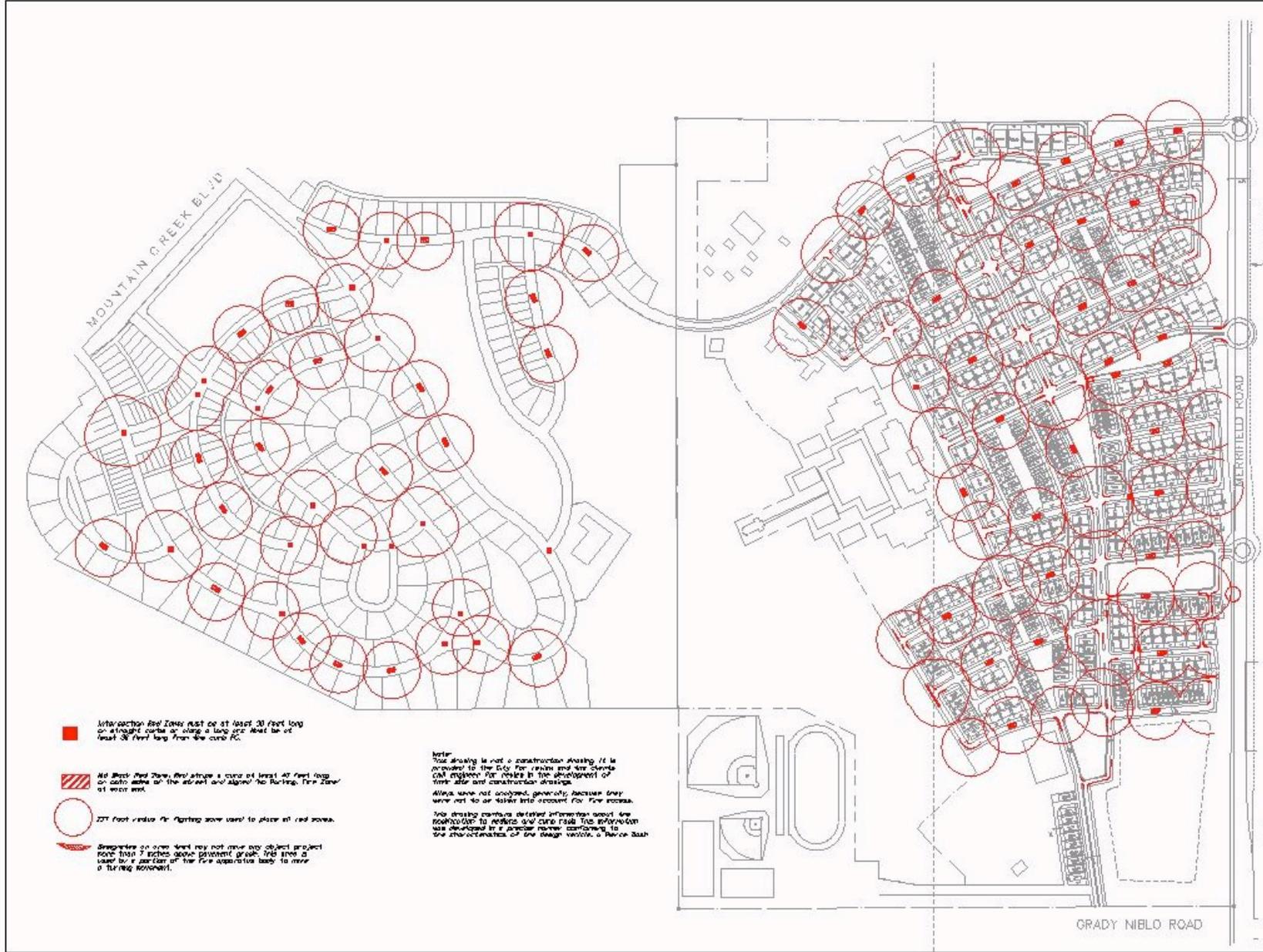
24' wide Street Analysis



PIERCE-DASH	feet
Width	: 8.75
Track	: 7.80
Lock to Lock Time	: 6.00
Steering Angle	: 45.00

Without leaving the pavement the design vehicle turns in a 24 foot wide alley with 16 feet of pavement width.

FIRE ACCESS ROAD



- 
 Intersection Fire Zones must be at least 30 feet long on straight curbs or along a long arc. Must be at least 30 feet long from the curb RC.
- 
 All Street Fire Zones must have a curb of least 40 feet long on both sides of the street and align to Parking Fire Zone at each end.
- 
 225 foot radius for spacing zones used to place all red zones.
- 
 Signposts on one side may not have any object project more than 7 inches above pavement grade. This area is used for a portion of the Fire apparatus body to clear a turning movement.

*Note:*  
 This drawing is not a construction drawing. It is provided to the City for review and fire clients can request for review in the development of final fire and construction drawings.  
 Areas were not analyzed, generally because they were not to be added into current fire zone process.  
 This drawing contains detailed information about fire zone locations to address and curb radii. This information was developed in a previous review conforming to the characteristics of fire design vehicle, a fire truck.

**PROJECT:**  
**Fire Zone Service Plan**  
**PDD 521 and 545**  
**Dallas, Texas**

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**SCALE:**  
 1" = 100'-0"

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**DATE:**  
 05/15/2014

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**PROJECT NO.:**  
 14-0000000000

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**DESIGNER:**  
 SWIFT AND ASSOCIATES

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**PROJECT MANAGER:**  
 JAMES W. SWIFT

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**PROJECT ENGINEER:**  
 JAMES W. SWIFT

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**PROJECT ARCHITECT:**  
 JAMES W. SWIFT

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**PROJECT CONTRACTOR:**  
 JAMES W. SWIFT

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**SHEET**  
 1 / 1

# SILVERTIP VILLAGE

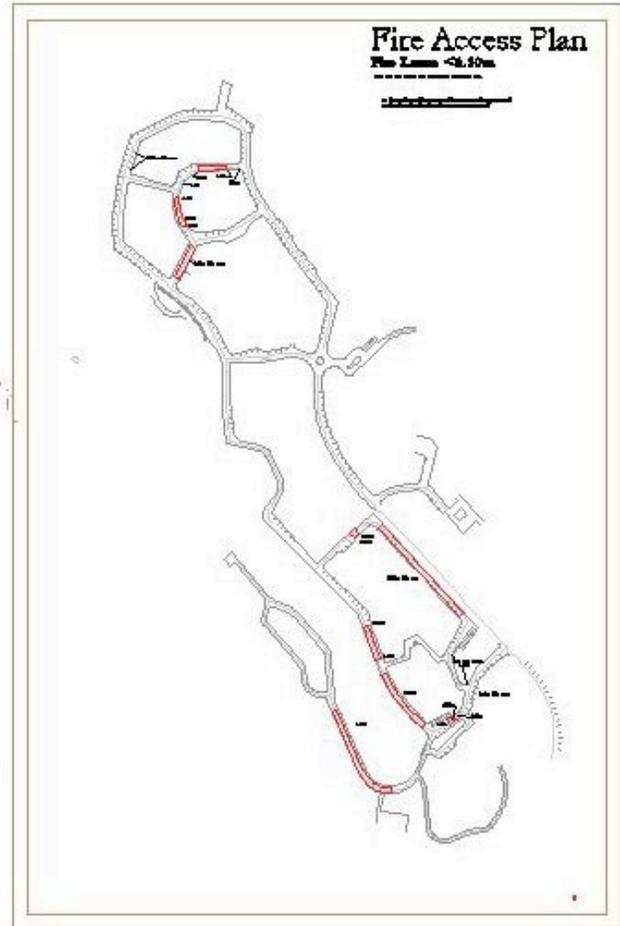
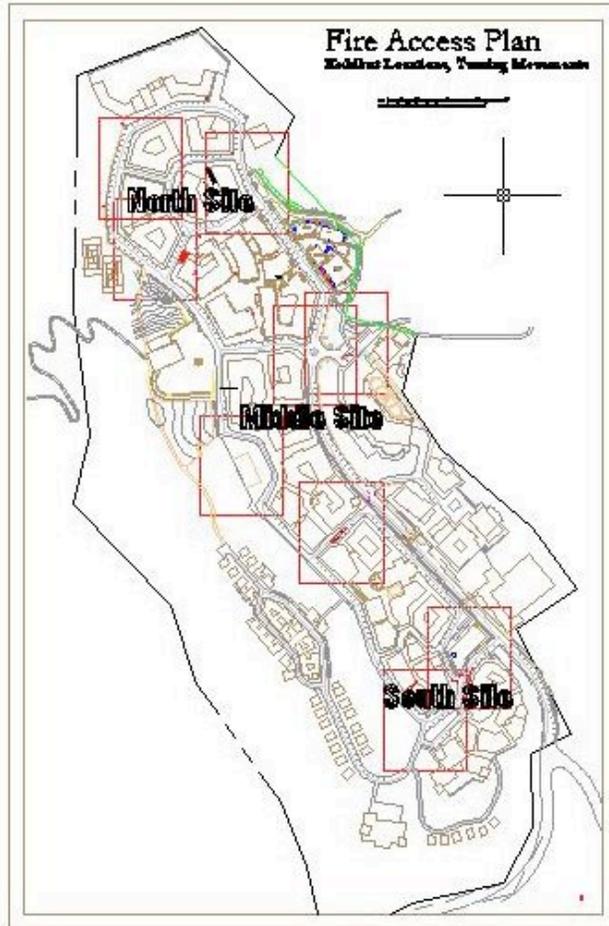
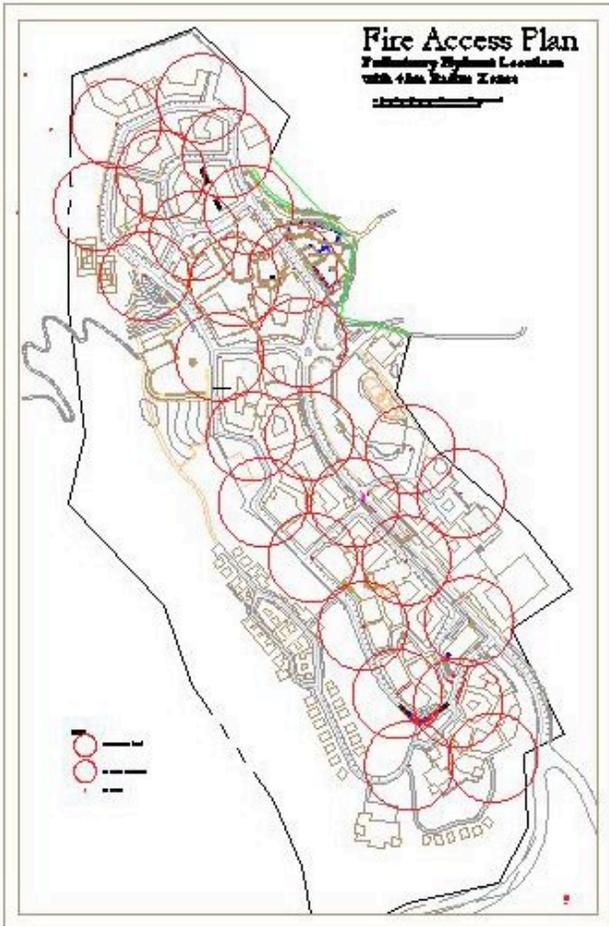
Canmore, Alberta

MASTER PLAN

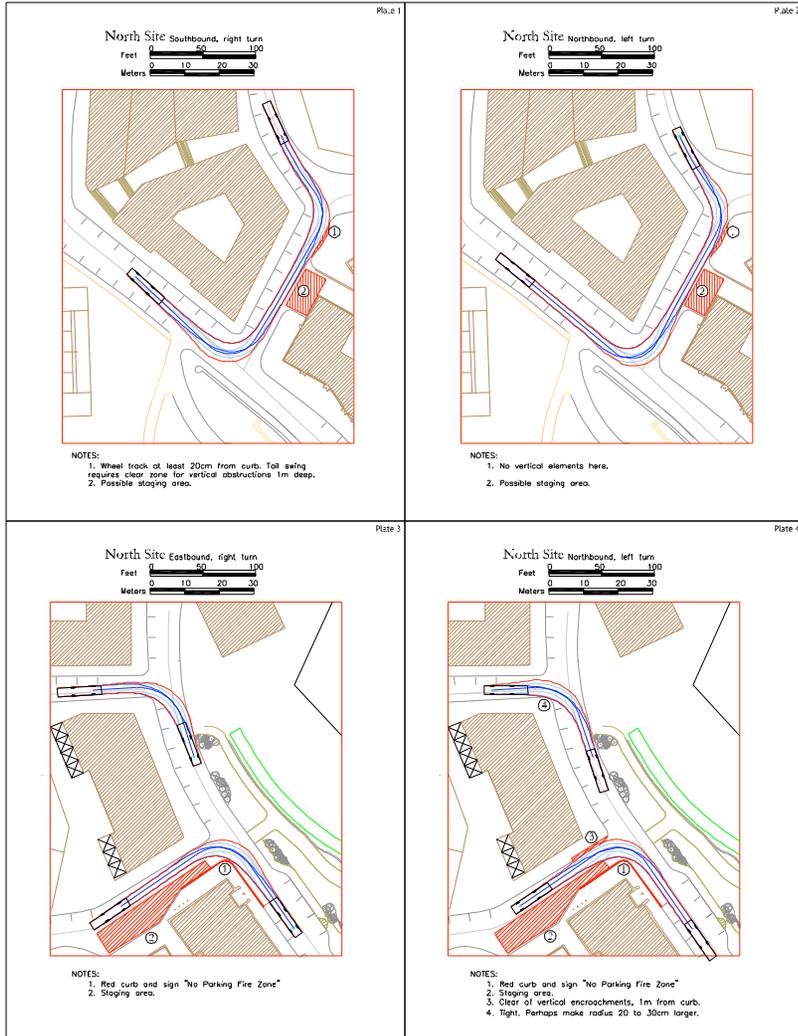
Master Plan

Descriptive Plan





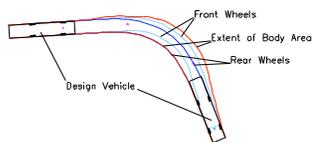
## Fire Access Plan Apparatus Turning Movement Plan



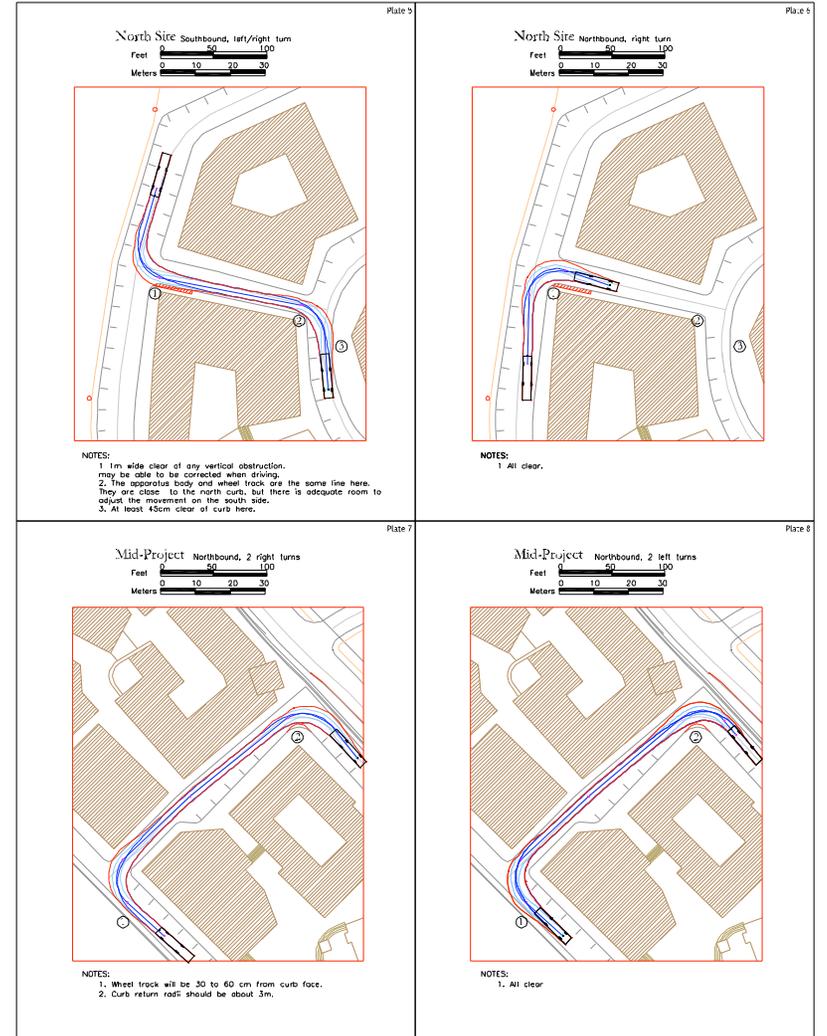
Legend:

- Potential Apparatus Staging Area
- Red Curb and Sign "No Parking Fire Zone"

Design Vehicle Turning Diagram

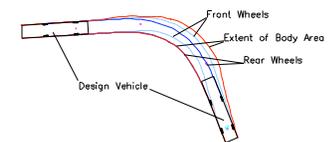


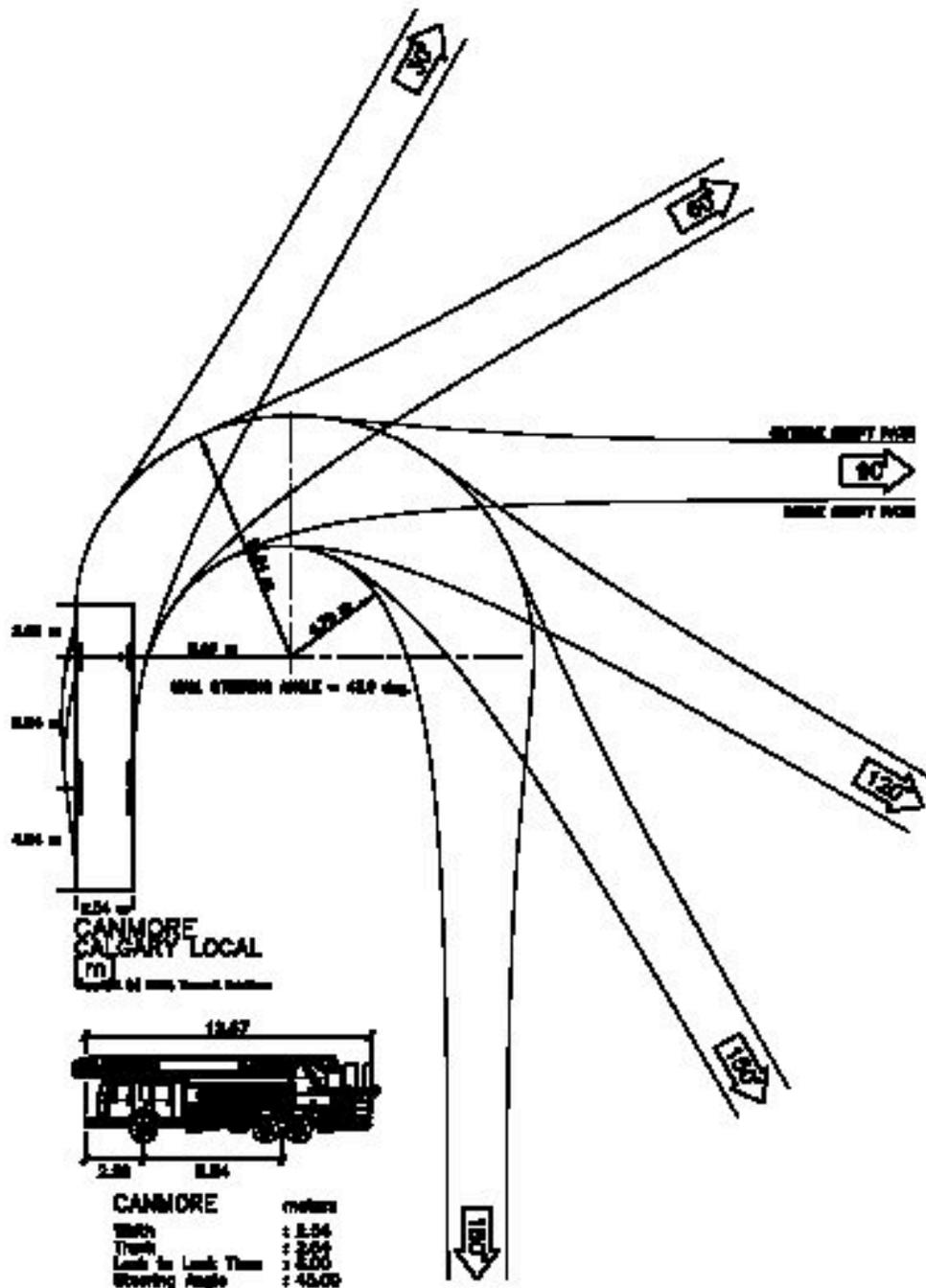
## Fire Access Plan Apparatus Turning Movement Plan



Legend:

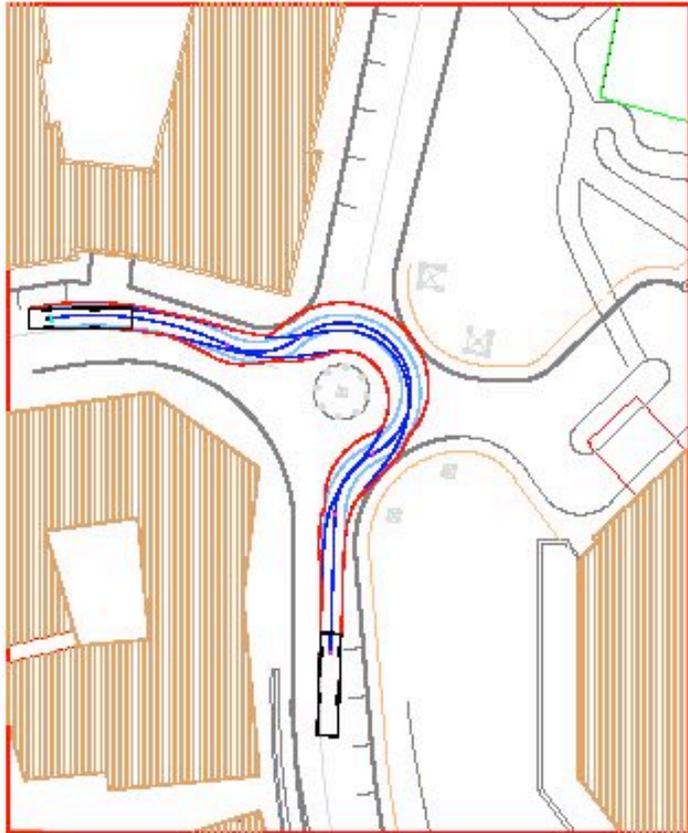
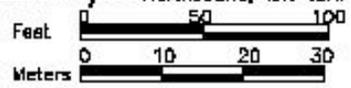
- Potential Apparatus Staging Area
- Red Curb and Sign "No Parking Fire Zone"





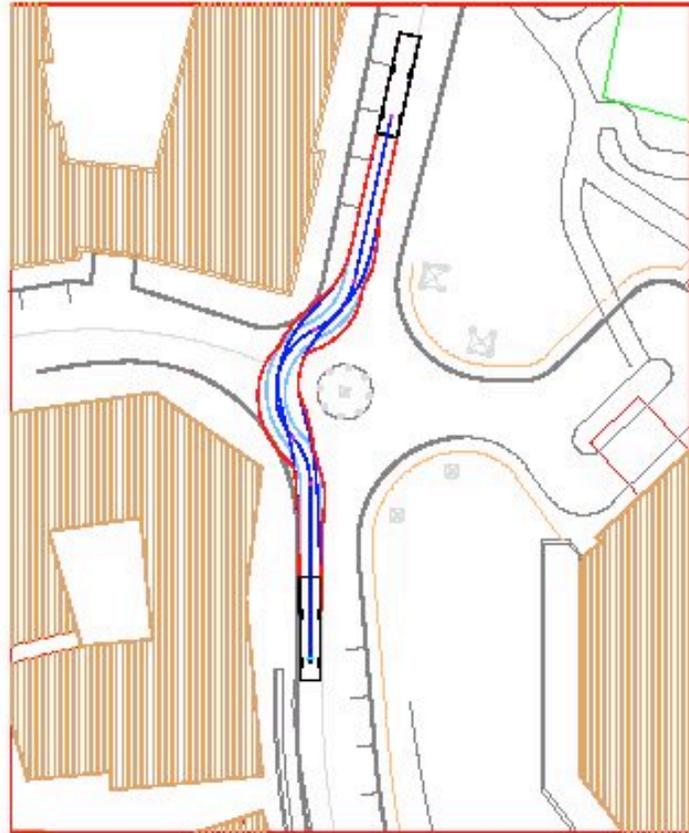
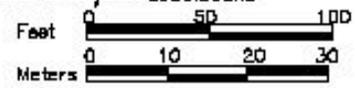
CANMORE	meter
Width	: 2.54
Track	: 2.04
Length	: 12.67
Steering Angle	: 45.00

**Mid-Project** Northbound, left turn



NOTES:  
1. All clear

**Mid-Project** Southbound



NOTES:  
1. All clear. Northbound also clear.

# STREETS AND PUBLIC SAFETY



Peter Swift, PE

SwiftLLC.com