

4N6XPRT Ped & Bike Calcs®

The **4N6XPRT Ped & Bike Calcs(R)** program provides **FIRST ESTIMATE** calculations to evaluate the speed of a vehicle involved in striking a pedestrian or bicyclist, IF Vehicle, scene, and pedestrian {or pedestrian and bicycle in a vehicle-bike accident} measurements are available. This program may also be used when skateboards or roller skates are involved.

Various items of information regarding a bicycle may also be obtained, if the information as to the number of teeth in the Chain Wheel (front sprocket) and Freewheel (rear sprocket) are known or can be estimated, and the radius or diameter of the rear wheel are known.

ESTIMATES of various pedestrian/cyclist dimensions are made if the total height is known.

Users of this program are given permission to use copies of the hard copy printout for Court and Deposition reports.

As of April 1995 the **4N6XPRT Systems(R)** programs Expert AutoStats(R), Expert Qwic Calcs(R), Expert TireStuf(R), and Expert VIN DeCoder(R) are accessible from within REC-TEC.

SYSTEM REQUIREMENTS

4N6XPRT Ped & Bike Calcs(R) has been tested on a wide variety of IBM laptop and desktop clones ranging from 8088 thru 80486. A math co-processor chip is **NOT** required. **4N6XPRT Ped & Bike Calcs(R)** has also been tested under the various versions of MS-DOS from 3.0 thru 6.22 and on DrDOS 5.0 thru 7.0. It also works as a DOS program under Windows 3.x, Windows 95/98/Me/2000/XP, OS/2 2.x, and OS/2 WARP.

A variety of dot matrix printers emulating the EPSON series have been used with no difficulty as well as Hewlett-Packard II, IIP, III and IIIP Laser printers.

* Menu layout, Menu Selections, Sample INPUT, and Sample OUTPUT are provided for illustrative purposes only and are subject to modification without notice.

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Company/Dept: _____
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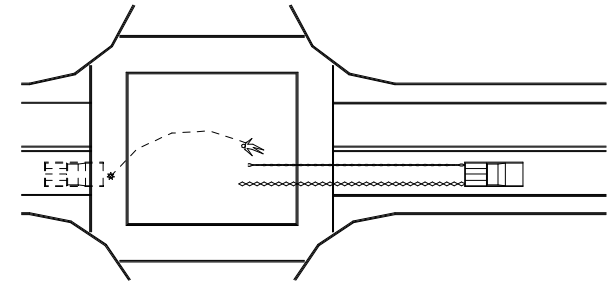
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8387 University Avenue
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Telephone Orders:
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4N6XPRT Ped & Bike Calcs®



4N6XPRT Ped & Bike Calcs(R)
MENU*

1. PEDESTRIAN - VEHICLE ACCIDENT
2. BICYCLE - VEHICLE ACCIDENT
3. SKATEBOARD - VEHICLE ACCIDENT
4. ROLLER SKATER - VEHICLE ACCIDENT
5. SPEED & DISTANCE With An Obstruction to Visibility

7. THROW DISTANCE FROM VEHICLE IMPACT SPEED
8. FORMULAS - Speed from Throw Distance
9. QUADRATIC FORMULA - You Provide A,B, & C Values!

10. SPECIAL APPLICATION CALCULATIONS

11. STOPPING SIGHT DISTANCE - ACTUAL v. AASHTO DESIGN
12. VISUAL FIELD OF VIEW - Central, Peripheral, Etc.
13. TYPICAL PEDESTRIAN SPEEDS - 17 Months TO 65+ - Walk/Jog
14. DAY OF WEEK - Given a Calendar Date

48. ENTER NEW PERSON or VEHICLE DATA

96. EXIT - QUIT - LEAVE This Program

Useful for evaluating vehicle speeds in
Vehicle vs. Pedestrian/Bicyclist
accidents

4N6XPRT Systems®
Forensic Expert Software
8387 University Avenue
La Mesa, CA 91942-9342

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1-800-266-9778

Sample INPUT*:

4N6XPRT Ped & Bike Calcs (R)
MENU*

1. PEDESTRIAN - VEHICLE ACCIDENT
2. BICYCLE - VEHICLE ACCIDENT
3. SKATEBOARD - VEHICLE ACCIDENT
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Enter Selection # : ? **1**

PRELIMINARY DATA INPUT

This information is necessary in order to run this program:

Enter the File Designation to Appear on Printouts: ? **Sample**

Enter the pedestrian's body weight {in Pounds} : ? **183**
Enter the person's height {in Inches} :? **73.75**

This program will compute Expected Body Segment Lengths if you do NOT have the actual detail dimensions of the injured pedestrian or cyclist.

Do you have Actual body segment lengths for the pedestrian/cyclist - Y/N? **N**

From vehicle measurements or Expert AUTOSTATS:
Enter the Vehicle Manufacturer (Ford, Subaru, etc.): ? **Ford**
Enter the Model: ? **Ranger SWB**
Enter the Model Year: ? **1983**

Enter the Curb Weight Vehicle {in Pounds}:? **2550**
Enter the Width of the Vehicle {in Inches}:? **67**
Enter the Height of the Leading Impact Edge of Vehicle {in Inches}:? **38**
Enter the Height of the Vehicle Bumper Top Edge {in Inches}:? **18**
Enter the Front Bumper to Base of Windshield Distance {in Inches}:? **44**

Was the vehicle Hard Braking BEFORE Impact - Y/N: ? **N**

The THROW DISTANCE for a pedestrian struck by a vehicle is the Total Distance the Body Moves from the point of impact (POI) to the point of rest (POR), regardless of how far it rode on the vehicle, how far it flew through the air, and how far it traveled in contact with the ground!

What was the throw distance (in feet)? **38.5**

Did the vehicle have:
(1) A High profile [van, full size P/U, Town Car, Bus, etc.]
(2) A Low profile [small P/U, sport car, compact, etc.]

Enter appropriate number: ? **2**

Was the pedestrian:
(1) an adult,
(2) a child [under 13]?

Enter the appropriate number: ? **1**

- What was the surface the pedestrian came to rest:
1. Dry pavement [asphalt, concrete, compacted gravel, dirt]
 2. Wet pavement [asphalt, concrete, compacted gravel, dirt]
 3. Ice, hard packed snow, oil

Enter the appropriate number: ? **3**

- What was the material of the outer covering of the trunk:
1. Leather jacket or nylon-like windbreaker or jacket
 2. Cotton jacket or shirt
 3. Bare skin

Enter the appropriate number: ? **1**

For the 1983 Ford:

What was the Coefficient of Friction of tires on the roadway:
Enter the appropriate number: ? **.5**
The Distance After the POI to the Start of Braking {in Feet}: ? **35**
The Total Actual Braking Distance, Start to Vehicle POR {in Feet}:? **65**

- This Post-Impact Braking was:
1. Locked Skid
 2. Hard No Skid
 3. Moderate
 4. Light
 5. Engine Braking Only
 6. NO SIGNIFICANT BRAKING - DID NOT STOP

Enter the appropriate number: ? **2**

Sample OUTPUT*:

4N6XPRT Ped & Bike Calcs (R)
Ver. 3.0
Copyright 1989-1996 ALL RIGHTS RESERVED
By 4N6XPRT Systems
8387 University Avenue
La Mesa, CA 91941

Vehicle Speed at Impact from Pedestrian 'Throw' Distance For a throw distance of 38.5 feet, the velocity of the vehicle at the POI was about:

Method	Vehicle Speed MPH	Ft/Sec	Ave. Ped. COF	Ped. CG Ht (Inches)	Indicated Class
Vault (45 deg.)	24	35.2	N/A	46.5	FRWD. PROJ.
Sturz- Anglicized	27.1	39.8	N/A	46.5	WRAP
Appel - Low profile Adult	26.6 25.5	38.9 37.5	N/A N/A	46.5 46.5	WRAP WRAP
Searle - Minimum Maximum	19.9 21.4	29.3 31.5	0.4 0.4	46.5 46.5	FRWD. PROJ. FRWD. PROJ.
Barzeley	23.7	34.8	N/A	46.5	FRWD. PROJ.
Limpert	24.3	35.7	Tires = .5	46.5	WRAP
Sicherbatcheff	20.5	30	0.4	46.5	FRWD. PROJ.
Impact Speed:					
Ave. Maximum = Minimum =	24 27.1 19.9	35.3 39.8 29.3		Ave. Take-Off Angle: 0 Degrees Max. Take-Off Angle: 25.8 Degrees Min. Take-Off Angle: -1.3 Degrees	
Braking Data Speed:	27	39.6		Hard, No Skid Braking for 65 Feet	

FILE: Sample 12-23-1995
S/N: 890114PB03001 REG. OWNER: 4N6XPRT Systems

Vehicle Speed at Impact from Pedestrian "Throw" Distance
For a throw distance of 38.5 feet, the velocity of the vehicle at the POI was about:

Method	Vehicle Speed MPH	Ft/Sec	Ave. Ped. COF	Ped. CG Ht (Inches)	Indicated Class
Wood - NOTE #2 - Forward Projection:					
- Low	18.7	27.5	N/A	N/A	
- High	29.3	43.1	N/A	N/A	
- Ave.	24	35.3			FRWD. PROJ.
- Wrap Series:					
- Low	20.5	30.1	N/A	N/A	
- Hi	29.2	42.9	N/A	N/A	
- Ave.	24.8	36.5			WRAP
Casteel - NOTE #3	25.9	38.1	N/A	46.5	WRAP
Collins - See NOTE 4	8.9 12.3	13 18	0.4 0.8	46.5 46.5	FRWD. PROJ. FRWD. PROJ.
Fall/Slide - See NOTE 5	11.2 12 12.8	16.5 17.7 18.8	0.4 0.6 0.9	46.5 46.5 46.5	FRWD. PROJ. FRWD. PROJ. FRWD. PROJ.
Northwestern - Speed from Fall	17.6 18.4 20.6	25.8 27 30.2	0.4 0.45 0.6	46.5 46.5 46.5	FRWD. PROJ. FRWD. PROJ. FRWD. PROJ.
Speed from Slide - See NOTE 6	17.6 18.4 20.6	25.8 27 30.2	0.4 0.45 0.6	46.5 46.5 46.5	FRWD. PROJ. FRWD. PROJ. FRWD. PROJ.

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DATA USED

The Vehicle was a 1983 Ford Ranger SWB
The Vehicle Curb Weight Vehicle = 2550 pounds
The Height of the Leading Impact Edge of Vehicle = 38 Inches

The Pedestrian:
Pedestrian's Weight at time of incident = 183 pounds
*** Total Height = 73.75 inches. ***
Standing Center of Gravity to Ground Height = 46.5 inches.
Hips to Ground Height = 39.1 inches.
Buttocks to Ground Height = 35.8 inches.

Shoulder to Elbow Length = 13.7 inches.
Elbow to Fingertips = 18.7 inches.
Shoulder to Wrist = 24.5 inches.
Shoulder to Fingertips = 32.4 inches.

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NOTES:

1. The Appel, Searle, and Sturz formulas were taken from a paper by Steve Ashton prepared for a Pedestrian Accident course at the Institute for Police Technology and Management, University of North Florida, Jacksonville, Florida, in 1989.
2. These give the Low and High expected values for two categories of impact - Forward Projection and the Wrap Series
3. Not Valid for Forward Projection. Author states this formula is not completely validated as of 11/95. Use with caution at this time.
4. Collins recommends using 0.8 for the Coefficient of Pedestrian Friction for all cases. Both this value and the default values are given for comparison.
5. Original developers recommend a friction value 1.14-1.7 Times the Tire-Pavement friction value. The max and min values are presented together with the default value calculated for the road/clothing interaction selected.
6. Northwestern Traffic Institute states this is valid for Forward projection impacts only. They also 'suggest' that the Pedestrian Friction Coefficient be in the range of 0.45-0.6. These are included for comparison with the value used by this program.

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4N6XPRT Systems

Expert System Software for Litigation

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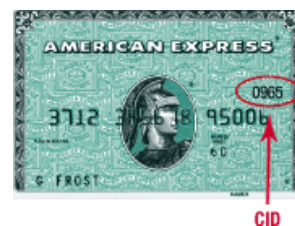
Card Number: _____

Expiration Date (MM/YY): ____/____



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Authorized signature: _____

We appreciate your cooperation in supplying us with this information and understanding that it is being required of us to obtain the information.

Sincerely,

A handwritten signature in black ink that reads 'Daniel W. Vomhof III'.

Daniel W. Vomhof III
General Manager/Technical Support