



We are all responsible for good roads

Cornell University
David P. Orr, P.E.
Director



Cornell Local Roads Program

- Founded in 1951
 - Serving 1,599 local municipalities




Who is Responsible?

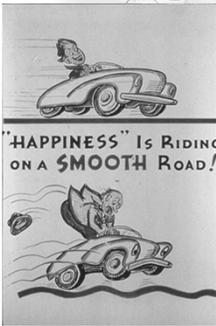


Who is Responsible?

- Highway Superintendent
 - NYSDOT
- Truck drivers
- Legislature
- ...



The Public will Blame ...



"HAPPINESS" IS RIDING ON A SMOOTH ROAD!

Department Responsibilities



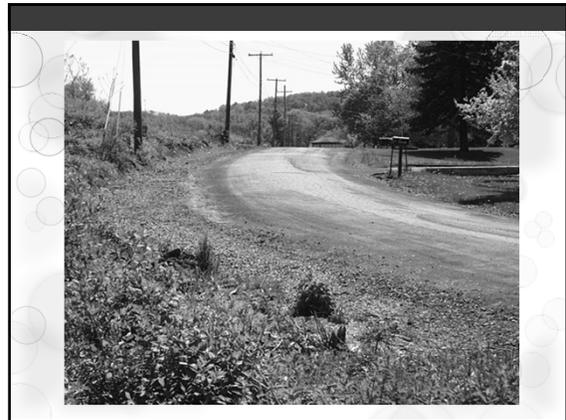


10 Standards	5 Maintenance
9 Legal Issues	4 Training
8 Money	3 Communications
7 Planning	2 Drainage
6 Construction	1 Safety



10 Standards

○ *A verbal contract isn't worth the paper it is written on.*
-Samuel Goldwyn



Appropriate Highway Standards

- AASHTO "Green Book"
 - NYSDOT Highway Design Manual
 - Low-volume Guidelines
- AASHTO Low-Volume
 - Locally-developed



Construction & Material Standards



9 Legal Issues

- The Sausage Law
 - *People who like sausage and respect the law,...*
 - *Should never watch either being made!*



The Law

- New York State Law
 - <http://leginfo.state.ny.us>
 - Local statutes



Purchasing

- Direct purchases
- Oral quotes
- Written quotes
- Bids
 - Exceptions



811



Right-of-Way & Highways by Use



Bridges



8 Money



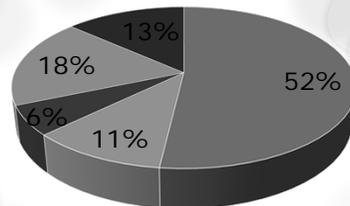
○ *The safest way to double your money is to fold it over once and put it in your pocket.*
- Kin Hubbard

NYS Highway Ownership

Level	Number	Centerline Mileage
Town	932	58,436
City	62	12,254
Village	551	6,598
County	57	20,239
State	n.a.	15,123
Other	n.a.	2,057
Total	1,602	114,709



NYS Highway Ownership



■ Town ■ City ■ Village ■ County ■ State

Bridges

Level	Number
Local	8,606
State	7,674
Total	16,280



Highway Budget Cost Per Mile

Level	\$ per CL mile	Quartile Range
Towns	~\$14,000	\$10-20,000
Counties	~\$35,000	\$26-46,000
Villages	~\$31,000	\$21-45,000
Cities (not NYC)	~\$37,000	\$30-54,000

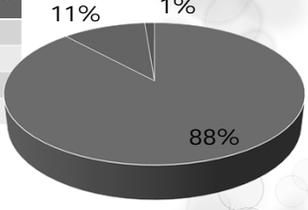
NYS Comptroller
www.openbooknewyork.com

Highway Budget Cost Per Person

Level	\$ per person	Quartile Range
Towns	~\$200	\$135-320
Counties	~\$116	\$67-184
Villages	~\$133	\$86-190
Cities (not NYC)	~\$130	\$83-196

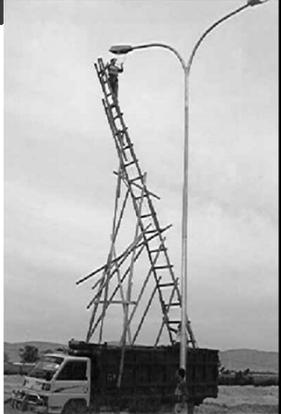
Local Highway Financing - Towns (2014)

Level	\$millions
Local	914
State	110
Federal	13
Total	1,037



■ Local ■ State ■ Federal

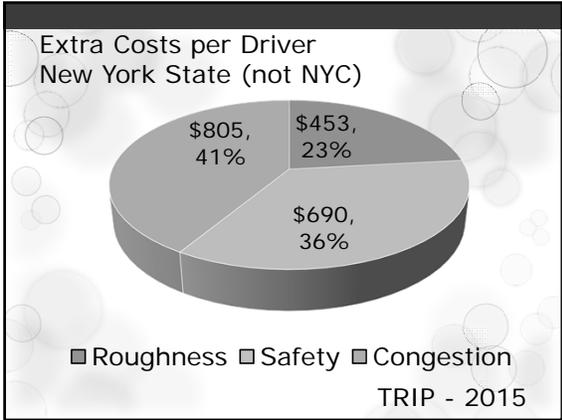
Cost of Roads



Hidden Costs

- Roughness
 - Safety
 - Congestion





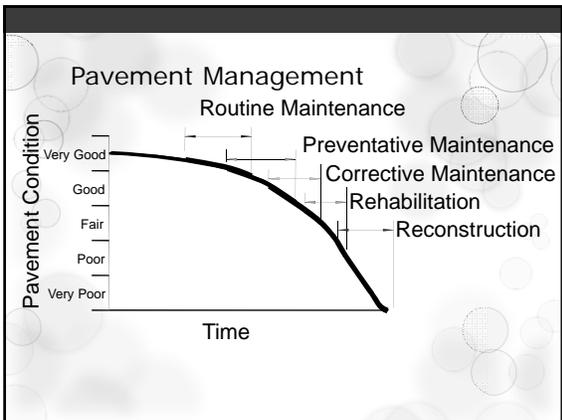
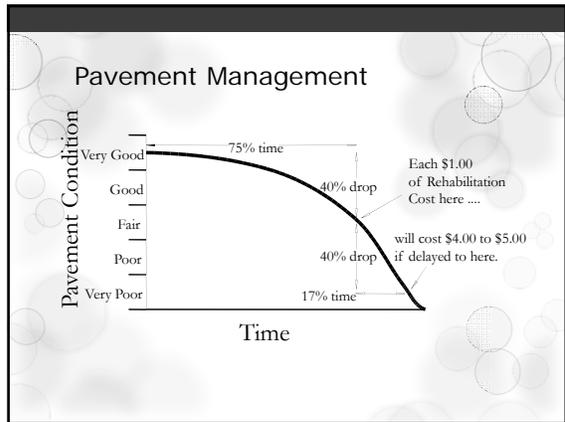
7 Planning

O In preparing for battle I have always found that plans are useless, but planning is indispensable.

-Dwight D. Eisenhower

Asset Management

- ✓ Right Treatment
- ✓ Right Place
- ✓ Right Time



Assets

- O Streets
- O Culverts
- O Signs
- O Guiderail
- O Equipment
- O Sewers
- O Water lines
- O ...

Cyclic Replacement Plan

$$\$/Yr = \Sigma \frac{\$new}{Life} * Number\ of\ items$$

$$\$/Yr = \Sigma \left(\$new \div \frac{(1+i)^n - 1}{i * (1+i)^n} * Number\ of\ items \right)$$

www.clrp.cornell.edu/workshops/managing.html

Steuben County Spreadsheet

ITEM TITLE	FUND/TRANSFERS	M. NO.	YR.	BUDGET YEAR FOR THE FISCAL YEAR																
				2008	2009	2010	2011	2012	2013	2014	2015	2016	2017							
PROPERTY TAXES				142																
SALES TAXES																				
FEES																				
GRANTS																				
TRANSFERS																				
INVESTMENT																				
DEBT SERVICE																				
OPERATING EXPENSES																				
DEPRECIATION																				
RESERVE																				
TOTAL																				
DEFICIT																				

2009 Budget's 6 items: \$5,303,000
 2009 \$ AVAILABLE: \$5,303,000
 DEFICIT: \$563,920

Steuben County Spreadsheet

\$3,367,650	\$0	\$5,866,920
6/1/08	7/3/08	
2009 Budget's 6 items		\$5,303,000
Transfers required		0
2009 \$ AVAILABLE:		\$5,303,000
DEFICIT		\$563,920



Paperwork

- Stay on top of paperwork
- Keep a daily diary

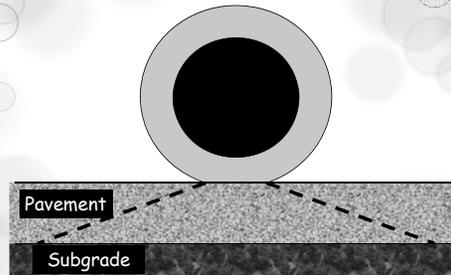


6 Construction

"We do it nice,
cause we do it twice."

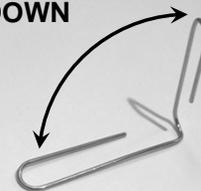


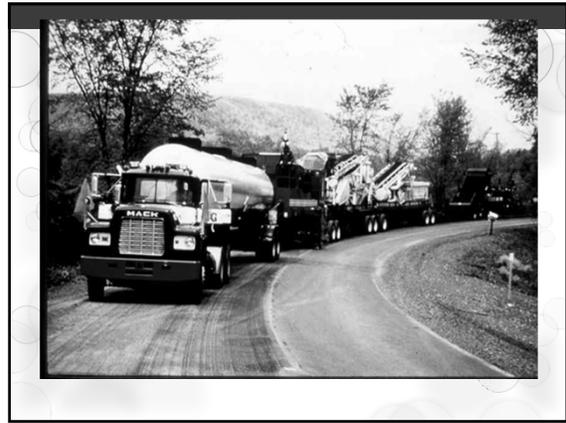
Why do we build pavements?



Paper Clip Analogy

UP - DOWN





Which Rehabilitation Technique?

- ✓ Right Repair
- ✓ Right Place
- ✓ Right Time

5 Maintenance

"You can pay me now, ...
Or you can pay me later."



Pavement Repair Alternatives

OBSERVE
Pavement distress

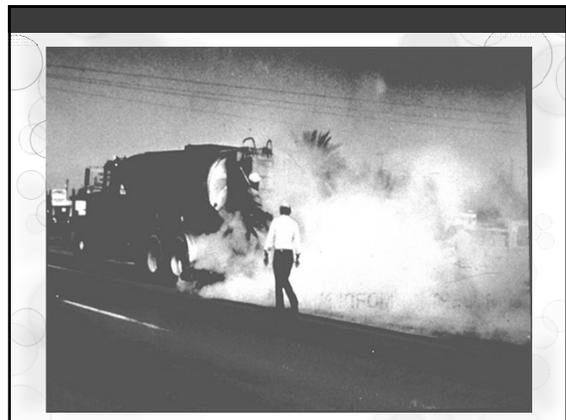
ANALYZE
Probable cause

EVALUATE
Alternatives



○The Right Repair???

The Right Treatment, Place, & Time?





4 Training

O How do you know what you don't know if you don't know you don't know it?

- Lynne Irwin, PE, 1941-2016,
Cornell Local Roads Program



Good Roads Week 1915



Training

- Books
- Videos & DVDs
- On-line
- Simulators
- Classroom
- On the job (OTJ)
- In-house
- Tailgate Talks
- Rodeo



Training Events

- Highway School
- Highway Superintendent's Conferences
- Regional Government Conferences
- ONYCOM Public Works School
- ONYSATE Meetings
- AOOT Annual Meeting



Resources

- Cornell Local Roads Program
 - County Highway Department
 - Soil & Water Conservation District
 - ONYS Dept. of Transportation
 - ONYS Dept. of Environmental Conservation
- Association of Towns
 - ONYS Town Supt. Association
 - ???

Cornell Local Roads Program

- Newsletter
 - Workshops
 - Statewide conferences
 - Special events & training
 - Library
 - Web page
 - Technical assistance
- www.clrp.cornell.edu**



Newsletters

- Quarterly – *Nuggets & Nibbles*
- Monthly email & online – *Road Chatter*



3 Communications

- Well done is better than well said.
- When you are arguing with a fool, make sure he isn't doing the same thing.



Our Customers



Winner of the "Not My Job" Award - ADOT
Litchfield Park, AZ 85

April 25, 2014

"Flint water is safe to drink."

News release from Flint city government



Traffic Control Devices

- Fulfill a need
- Command attention
- Convey a clear, simple meaning
- Command respect
- Give time for response

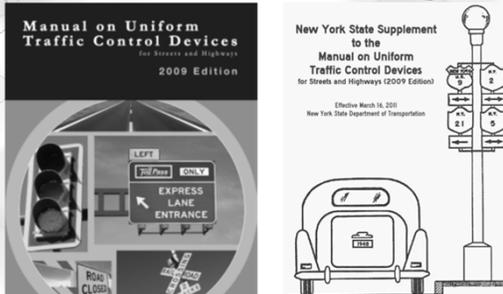


Signs Communicate

- Regulations
 - Warnings
- Information



NYS MUTCD



New York State Traffic Sign Handbook

1985 2002 2008 2011



Advanced Signs



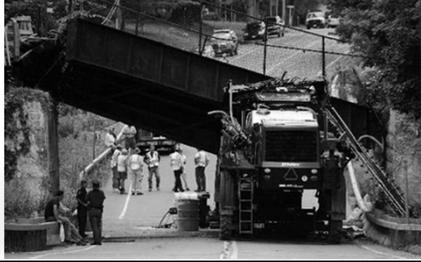
Stand in a Visible Location

but ...

Work Zone NYS

Working Together

Shared services



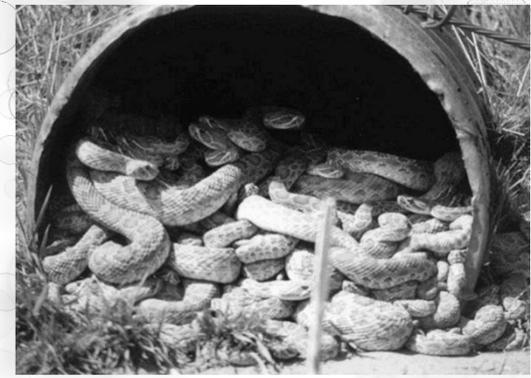
Emergencies

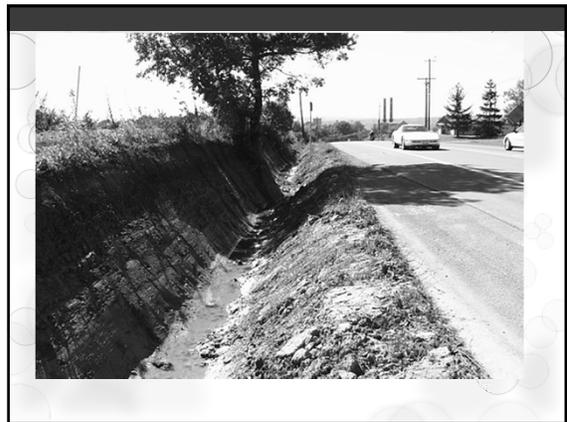
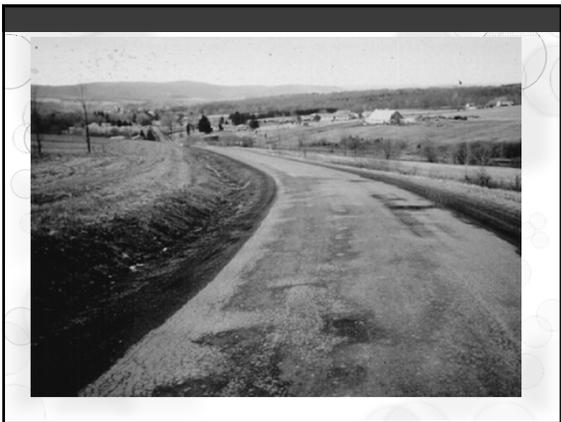


2 Drainage



- *Weather forecast for tonight: dark.*
- George Carlin
- *It takes a fool to test how deep the water is with both feet.*
- J. Wallace Day





1 Safety

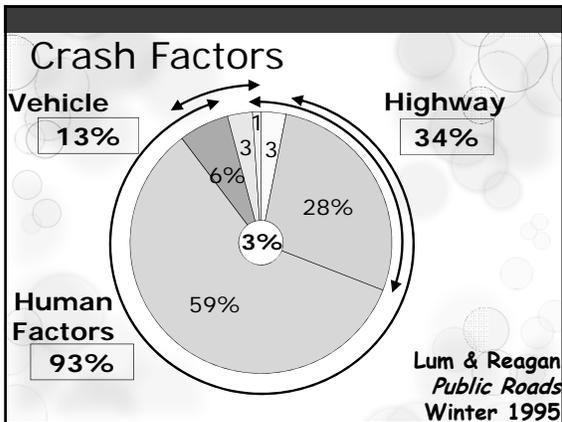
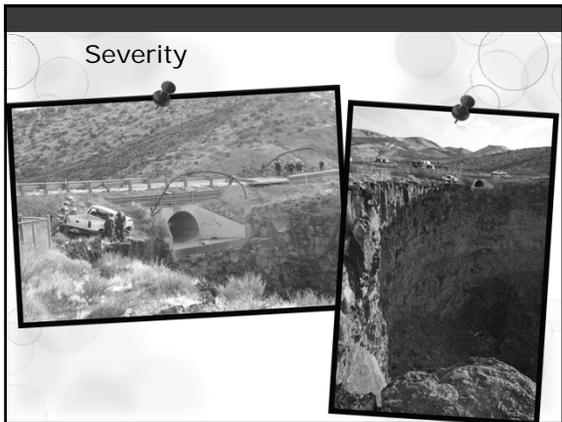
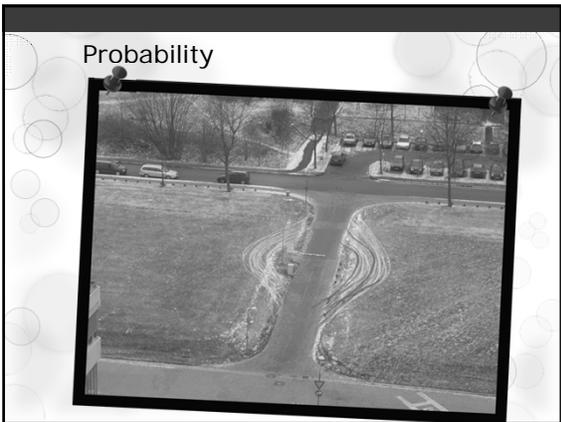
- *I have every sympathy with the American who was so horrified by what he had read about the effects of smoking that he gave up reading.*

- Henry G. Strauss



Crashes vs. Accidents

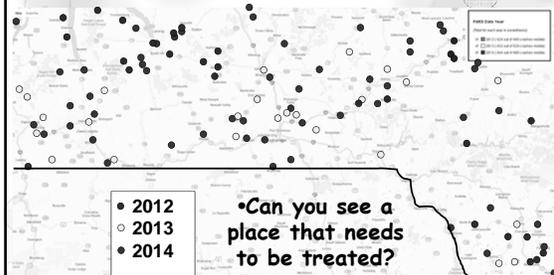
- Crashes
- Probability
- Severity
- Exposure



Cell Phone & Texting



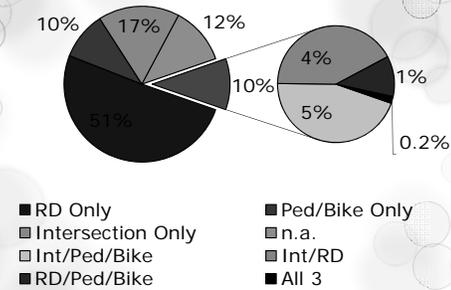
Southern Tier Fatal Crashes (2012-2014)



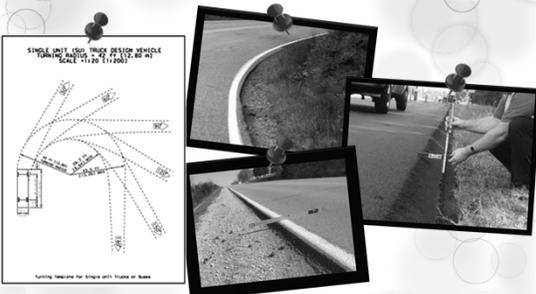
Traditional vs. Systemic Improvements

Caution
If you always do what you have always done, you will always get what you have always gotten.

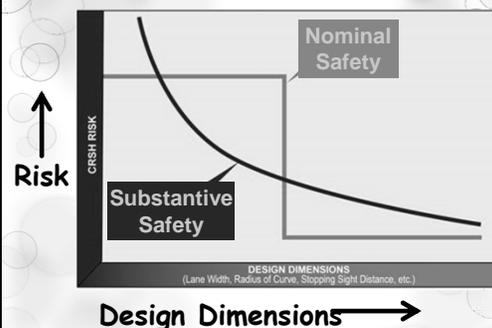
Fatal Crashes

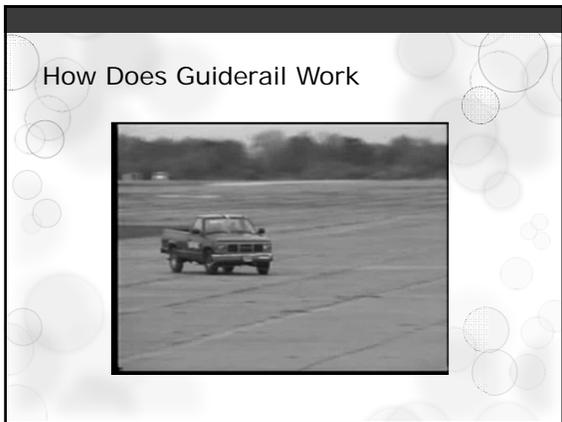
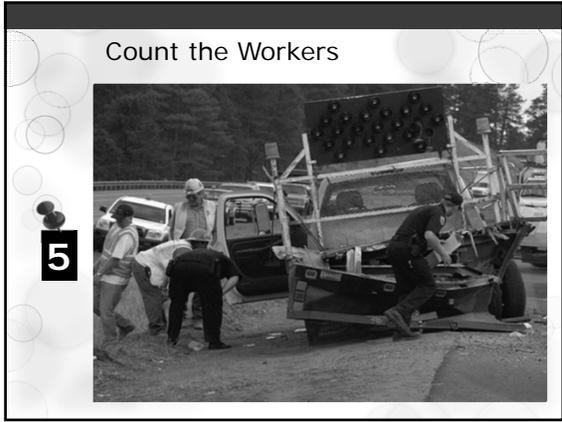


Repair Edge Drop Offs & Widen Curves



Nominal vs. Substantive Safety





Weak Post W-Beam



- | | |
|-------------------|------------------|
| 10 Road Standards | 5 Maintenance |
| 9 Legal Issues | 4 Training |
| 8 Money | 3 Communications |
| 7 Planning | 2 Drainage |
| 6 Construction | 1 Safety |

0 Attitude



FRANK AND ERNEST BOB THAVES



Closing Thoughts



Remember User Costs



Saving Money or Improving Service



Think Long Term, But Be Flexible



Scientists from the RAND Corporation have created this model to illustrate how a "home computer" could look, like in the near past. However the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require our yet invented technology to actually work, but in years from now scientific progress is expected to solve these problems. With a simple interface and the Fortran language, the computer will be easy to use.

Be Innovative



Do It Right the First Time



Stick to the Plan



Don't Worry, Be Happy



What is the maximum daily traffic when using the AASHTO LVR Standards?

A

100

B

400



C

1,000

D

4 horses or pedestrians

What is the minimum span of a bridge?

A 5'	B 20'
C 25'	D There is no minimum 

What percentage of CL mileage is *owned* by NYSDOT?

A 6%	B 11%
C 13% 	D 18%

What storm year was Katrina in New Orleans?

A 25 year	B 50 year 
C 100 year	D 500 year

One fully loaded 10-wheel dump truck does as much damage as:

A ~100 cars	B ~1,000 cars
C ~5,000 cars 	D A herd of buffalo

Which is NOT a good patching technique?

A Throw and Go 	B Semi-Permanent
C Throw and Roll	D Spray patching

Who is welcome at CLRP workshops and events?

A Municipal employees	B Consultants
C State employees	D Everyone even Donald and Hillary 

We communicate the most by which of the following?

A Verbally	B In writing
C Non-verbally 	D Sleeping

In 1 mile of ditch, how many tons of material are eroded before you can detect the erosion?

A 1 ton	B 3 tons
C 30 tons 	D 300 tons

A vehicle traveling at 60 mph is moving at approximately...?

A 40 ft/sec	B 60 ft/sec
C 90 ft/sec 	D 120 ft/sec



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