The Problem

- 4,600+ pedestrian fatalities nationwide
- 71,000 pedestrian injuries
- Speeding associated with 1 in 3 highway fatalities
- Higher speeds cause more severe pedestrian injury
- Traditional traffic calming not applicable to all streets
Motivations

• Desire to improve pedestrian safety
• Neighborhoods clamoring for speed reduction
  – With engineering treatments
  – Demanding engineering treatments
• Emergency services objecting to some engineering treatments on selected streets
• Need to have techniques that can be implemented quickly
  – Interim response
  – Rapid reaction
Research Approach

• Pilot study (completed)
  – Develop techniques
  – Prove concept

• Field study (ongoing)
  – Determine crash reduction potential of the program
  – Assess the relationship between speed and crash incidence
The Ongoing Field Test in Philadelphia
Expanding the Pilot Study

- Larger scale study in Philadelphia
- Add crash analysis
  - Pedestrian and vehicle
  - Multiple vehicle
  - Single vehicle
- More analysis of countermeasure process
- Effectiveness of individual countermeasures
- Persistence of any speed reductions
Key Players

- Department of Streets
- Police Department
- Street Smarts
- PennDOT
- Pennsylvania Bureau of Driver Licensing
Citywide but Focusing Enforcement in 6 Police Districts

- Largely residential
- High pedestrian crashes
- Speeding violations
- Citizen complaints
- Department of Streets interest
- Police commanders’ interest
Enforcement = Speed Trackers
Publicity

- Materials from the pilot test
- New materials as needed
- Involvement of *Street Smarts*
- Earned media
- Tie-in of 3-D markings to publicity
Data To Be Collected

- Crashes: police crash reports
- Injury severity: police and hospital reports
- Vehicle speeds: automated traffic counters
- Exposure, knowledge, attitudes: survey
- Extent of walking/quality of life: focus groups
- Process: focus groups, implementation records
State-of-the-Art Speed Measurement

Radar

Pneumatic Tube
Status

• Already done
  – Baseline speed data have been collected
  – 3-D installed at 9200 Bluegrass Road
  – Speed humps installed at one site
  – Kickoff press conference
  – Signs installed in 2 Districts
  – Speed Trackers are installed (24 total)
  – Officer instructor training on trackers
  – Speeding tickets are being written
  – Baseline awareness survey (7,300 surveys)
Pending

- Installation of remaining 3-D
- 3 more speed trackers to be installed
- Signs to be installed in remaining districts
- Focused education
- Increased enforcement to continue
Contact

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fdennisthomas@aol.com

www.dunlapandassociatesinc.com
Gloucester County
Emergency Medical Service

The **First** County Provided
Basic Life Support Agency
In New Jersey!
Andy Lovell
NJ MI CP, NREMT/P
EMS Chief

J. Thomas Butts
Director
Emergency Response
Previous Service Delivery Model

- Most EMS agencies began as small volunteer entities.
- Squads were located in communities with sufficient volunteers base and financial resources.
- Placement was not based upon need.
Call Volume Increase

- The number of requests for service continues to rise at a rapid rate (increased population, increased senior population, increased highway congestion and accidents)
Volunteer Availability

- The number of trained and available to respond volunteers is declining (nationally).
- Family and career time requirements limit an individual’s time available for volunteer activities.
- Increased training and recertification requirements.
Increasing Call Volume

Decreasing Volunteers
The “Dirty Little Secret” of EMS

- Local squad is dispatched, but unable to respond
- “Mutual Aid” squad is dispatched from another jurisdiction
- Results in unacceptable response times
- Creates potentially life threatening situation for the patient
Inadvertent Consequences

- Resources from one community are depleted to provide service in another.
- Financial implications municipality providing mutual aid into the receiving municipality.
- Mutual aid becomes the “norm” rather than the exception.
The Solution?
Regionalization
Benefits for the Taxpayer

- Sharing scarce resources (taxpayer dollars) across geographical boundaries
- Administrative overhead is shared, expensive duplication is eliminated
- Training is centralized and coordinated, standard of care keeps pace with technology
Benefits for the Taxpayer

- Staffing and crew placement decisions can be made based upon need, not lines on a map – resulting in lowered response times
- Elimination of “Have” and “Have Not” municipalities
- Growth in size or level of service provided more affordable
Benefits for the Taxpayer

- End result – improve the quality of service provided to the taxpayer, at a lower per capita cost!
How Do We Get There?

- We are the government! What do we do best?
- Create a panel or committee to take a look at the problem.
Steering Committee Representatives

- Volunteer Ambulance and Rescue Association (GC version of the FAC)
- Career EMS Chiefs Association
- Mayors Association
- Municipal Administrators
- Hospitals
- Freeholder and County Admin
Steering Committee Tasks

- Survey existing EMS agencies and municipalities to determine financial impact of current service delivery model – true cost, both direct and indirect (squad data and municipality)
- Long term debt
- Survey same for current equipment inventory
- Review other delivery models outside NJ
Steering Committee Tasks

- Meet frequently
- Make public the committee’s activities (web site posting and US Mail)
- Analyze existing response date
Steering Committee Tasks

- Create and re-create a response plan based upon existing response data.
- Presentations were made to each municipality's governing body early in the process to solicit input.
Areas of Concern

- Am I going to lose my job??????
- “They” won’t be able to find our residents’ homes (MICU’s do it everyday)
- What about the Department of Personnel (Civil Service?)
- The Training Fund (OEMS)
Areas of Concern

- Reimbursement – one of the four letter words in EMS
- Budget cap
- Recruiting, screening and hiring a workforce
Gloucester County EMS

- Review current call volumes, determine what the real numbers are
- Create a recruitment program early and work it relentlessly
- Take advantage of other county department’s expertise; IT, finance, B&G, fleet, risk mgt
GCEMS Service Area

- 1 service area
- Not 12 individual service areas
- Regionalization erases the artificial lines on the paper map
- Closest crew to the incident location responds
- GPS/AVL in 2008
Recruitment

- Application package delivered to every squad and fire company, web postings
- Recruited employees and volunteers of existing agencies (consolidation)
- Set up fair, equitable and consistent applicant evaluation
Consolidate Existing Resources

- Inventory and evaluate current fleet, station facilities and supplies
- Eliminate duplication based upon jurisdictional boundaries
- Negotiate with vendors for improved cost structure
Improve Operating Efficiencies

- Take advantage of technologies available, both to reduce cost and improve patient treatment
- Share infrastructure cost with other public agencies
- Provide award winning outreach
State of New Jersey
Department of Health and Senior Services
Office of Emergency Medical Services

EMS System Review

August 2007

Submitted by:
TriData, A Division of
System Planning Corporation

GLoucester County, NJ
Emergency Medical Service
Recommendations:

- Legislation should be passed that requires local municipalities to provide EMS (or cause to be provided).
- All EMS providers should be regulated – All providers, regardless of operating platform, should be regulated by OEMS.
Recommendations:

- The OEMS and NJ SFAC should work to devise a plan that will encourage consolidation of squads in areas where geographic, human resources, or economies of scale issues make consolidation logical.

- The NJ OEMS in conjunction with the NJ EMS Council should determine response time standards for EMS that apply to all agencies.
Recommendations:

- All BLS ambulances, regardless of delivery platform, must be staffed with at least two NJ certified/licensed EMT-Bs.
- Encourage the development of county-level EMS oversight.
Recommendations:

- The New Jersey EMS system is in need of an overhaul.
No Kidding!
Danger Zones:

- Special interest looking to protect their own turf, double your expectation
- We are the government, consider our speed!
- Change brings fear, don’t get involved in the emotional aspect – do what is right for the taxpayer and patient
Danger Zones:

- Remember the size of the project regarding purchasing and acquisition – bid thresholds and timing
- Establish relationships with industry experts, NJ is not the first place to take on this type of project
Remember:
The most important person involved isn’t me and it isn’t the special interest groups – it is the patient.
End Result?

- Over 10000 responses
- GCEMS average response time 6:06
- Exceeds national standard of 9:59
- Continual repositioning of crews to maintain adequate response times
- Lives have been saved!
Questions?
Highway Safety in Pennsylvania

Delaware Valley Regional Planning Commission
Regional Safety Task Force Meeting
October 1, 2008
According to the historical trend line, total traffic fatalities have been increasing at a rate of 1 per year since 1998.
PA Annual Fatality Rate

Pennsylvania Highway Fatality Trend
Total Traffic Related Fatality Rate

According to the historical trend line, the fatality rate has been decreasing by 0.01 per year since 1998.

$r = -0.6136$
PA 2007 Highway Fatalities
Summary

- Lowest Number of Fatalities in 10 years
  - Unrestrained Fatalities
  - Alcohol-Related Crashes
  - Hit Tree Crashes
  - Hit Utility Pole Crashes
  - Head-On / Opposite Direction Side Swipe Crashes
  - Intersection Crashes
  - Running Red Light Crashes
  - Crashes Involving Drivers Age 75+
PA 2007 Highway Fatalities Summary

- Greatest Increase Statewide, 2006 – 2007
  - Aggressive Driving Crashes
  - Speeding-related Crashes
  - Hit Guiderail Crashes
  - Motorcycle-related Crashes
Comprehensive Strategic Highway Safety Improvement Plan (CSHSIP)

“Vital Six” Safety Focus Areas
- Reducing Aggressive Driving
- Reducing Impaired (DUI) Driving
- Increasing Seatbelt Use
- Safety Infrastructure Improvements
  - Reducing Roadway Departure & Intersection Crashes
- Improving the Crash Records System
- Improving Pedestrian Safety

Emerging Areas
- Motorcycle Safety
- Senior Driver Safety
2007 Fatalities per MPO/RPO

03-07 Baseline Average vs. 2009 Fatality Goals
MPO and RPOFatalities by Region

MPO/RPO

03-07 Average Fatalities  2007 Actual Fatalities  2009 Goals
PennDOT District 6-0

District 6-0 Total Fatalities

<table>
<thead>
<tr>
<th>Year</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>366</td>
</tr>
<tr>
<td>2004</td>
<td>321</td>
</tr>
<tr>
<td>2005</td>
<td>300</td>
</tr>
<tr>
<td>2006</td>
<td>313</td>
</tr>
<tr>
<td>2007</td>
<td>319</td>
</tr>
</tbody>
</table>

Avg 324
PennDOT District 6-0

- Highest Fatalities in 2007
  - Aggressive Driving Crashes (183)
  - Single Vehicle Run-Off-the-Road Crashes (132)
  - Alcohol-Related Crashes (117)
  - Hit Fixed Object Crashes (111)
  - Intersection Crashes (100)
  - Unrestrained Fatalities (90)
  - Speeding Crashes (82)
  - Local Road (only) Crashes (78)
  - Pedestrian Crashes (62)
  - Hit Tree Crashes (58)
PennDOT District 6-0

- Greatest Decrease in District 6-0, 2006 – 2007
  - Hit Utility Pole Crashes (39 to 27 fatalities)
  - Stop-Controlled Intersection Crashes (37 to 17 fatalities)
  - Intersection Crashes (122 to 100 fatalities)
Safety Countermeasures: Behavioral

- Ignition Interlock Program
- Seat Belt Use
- Impaired (DUI) Driving
- Aggressive Driving
Safety Countermeasures: Infrastructure

- Pedestrian Countdown Signals
- Rumble Strips
- Utility Pole Relocation/Consolidation
- Advanced Curve Warning Pavement Markings
- Yield to Pedestrian Channelizing Devices
Significantly Reduce Fatalities

1. Centerline rumble strips on all traffic routes with greater than 5,000 ADT (2,500 miles)
2. Edgeline/shoulder rumble strips on all traffic routes with greater than 5,000 ADT (2,750 miles)
3. Address Top 5% Crash Locations (4 in District 6-0)
4. Local Road Low Cost Safety Improvements (2,000 locations)
5. Interstate/Expressway Median Barrier at Dual Structures (50 locations)
6. Cable Median Guide Rail at High Incidence Crossover Locations (15 miles)
7. Aggressive Driving “Smooth Operator” Program
Future Initiatives

1. How do we make all partners/stakeholders own the safety goals?
2. How do we motivate and sustain safety efforts by all partners?
3. How do we truly combine the 4 E’s and address them at high-crash locations?
Future Initiatives

4. How do we track the progress towards meeting our goals by establishing leading indicators and not lagging indicators?
5. Marketing safety
6. Action plan with specific times and owners
Questions?

Gary Modi, PE
Chief, Safety Management Division
Bureau of Highway Safety and Traffic Engineering
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Low Cost Safety Solutions
Introduction

Highway Traffic Fatalities Trend

![Bar chart showing the trend of highway traffic fatalities from 1988 to 2007.](chart.png)
Introduction

Traffic Safety Facts 2007:

- 41,059 fatals are the lowest since 1995

- 2,490,000 Injuries,
  - down 3.3% from 2006!
  - down for the 8th straight year!
  - 1st time below 2.5 million!

- Areas for improvement
  - Pedestrians injury collisions
    - up 15% to 70k injuries in 2007
  - Motorcycle fatals 10 year increase continues to 5154 in 2007
## Introduction

### 2006 & 2007 Highway Statistics:

<table>
<thead>
<tr>
<th>Exposure Measure</th>
<th>Year</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
<td>2007</td>
</tr>
<tr>
<td>Vehicle Miles Traveled</td>
<td>3,014,016M</td>
<td>2,996,232M*</td>
</tr>
<tr>
<td>Registered Vehicles</td>
<td>225,684,815</td>
<td>230,199,000**</td>
</tr>
<tr>
<td>Population***</td>
<td>293,657,924</td>
<td>296,410,924</td>
</tr>
</tbody>
</table>
Introduction

Cost of All Crashes in U.S. (Year 2007)

- $300 Billion
- $1070 for every person in the U.S.
- 2.8% of the GDP
Introduction

- **U.S. Highway System Among World’s Safest**
  - 2007 Fatality Rate decreased to 1.3 fatals per 100 mvm traveled!
  - **But** over 41,000 Deaths & 2,490,000 Injuries per Year

- **US DOT Safety Goals (FHWA, NHTSA, & FMCSA)**
  - National fatal rate of 1.0/100mvm traveled
Rural Non-Interstate Safety

Rural Non-Interstate Fatality Rates are the 800-lb Gorilla of Highway Safety

<table>
<thead>
<tr>
<th>Roadway Function Class</th>
<th>Fatality Rate (100 mil VMT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Interstate</td>
<td>0.5</td>
</tr>
<tr>
<td>Non Interstate</td>
<td>1.0</td>
</tr>
<tr>
<td>All Roads</td>
<td>1.5</td>
</tr>
<tr>
<td>Rural Interstate</td>
<td>2.0</td>
</tr>
<tr>
<td>Rural Non Interstate</td>
<td>3.0</td>
</tr>
</tbody>
</table>
Roadway/Roadside

Run-Off-the-Road

Intersections

Pedestrians
Run-Off-the-Road

Problem
- 1/3 of all Traffic Fatalities
- 2/3 on 2-lane roads
- 1/2 at night
Run-off-the-Road

Reasons

Inattention

Speeding

Impaired Driving

Avoidance of obstacle

Poor visibility
Roadside Hazard Fatalities

- Tree: 28%
- Embankment: 10%
- Conc. Barrier: 2%
- Br. Rail: 2%
- Utility Pole: 9%
- Sign Post: 6%
- Fence: 4%
- Culvert: 5%
- Curb: 6%
- Ditch: 8%
- Guardrail: 10%
- Other: 10%
Run-off-the-Road Solutions

Remove obstacle

BEFORE

AFTER

Digitally enhanced photograph
Run-off-the-Road

Relocate obstacle

BEFORE

AFTER
Run-off-the-Road

Reduce impact severity with Crashworthy Devices
Run-off-the-Road Solutions

Shield obstacle
Run-off-the-Road

Delineate obstacle
Roadside Hazard Fatalities

- Tree: 28%
- Embankment: 10%
- Other: 10%
- Sign Post: 6%
- Fence: 4%
- Utility Pole: 9%
- Drainage Features: 19%
- Guiderail/Barrier: 14%
Longitudinal Barriers

- Rigid
  - TL-3
  - 100 kph/62 mph
  - 820kg Car; 2000kg Pickup

- Semi-Rigid

- Flexible
Longitudinal Barriers

- Rigid
- Semi-Rigid
- Flexible

TL-3 100 kph/62 mph
820kg Car; 2000kg Pickup
End Terminals

BCT

Sand Barrels

Adiem II

QuadGuard
Intersection Safety

- 25% of Fatal Crashes
- 50% of Injury crashes
Intersection Safety

Vehicular conflict points:
Conventional Intersection

Conflict Types
- Diverge: 8
- Merge: 8
- Crossing: 16
Total: 32
Intersection Safety
Countermeasures

- Unsignalized
  - Sight distance
  - Turn bays
  - Flashing beacons at rural intersections
  - Intersection lighting

- Signalized Intersections
  - Retiming / coordinating signals
    » All red clearance interval
    - Curb-corner radius design
    - Red light cameras
Intersection Safety
Red Light Running
Intersection vs. Roundabout

# of Conflict Points:
Roundabouts 8
Conventional Intersection 32
Pedestrians

- 4,654 Pedestrians Killed (~12% of all traffic fatalities)
  - 58% are working adults; 23% are elderly; 19% are children
- A pedestrian is killed or injured every 4 minutes
Countermeasures

- Reduce Pedestrian Exposure to traffic
- Improve sight distance
- Reduce Vehicle Speed
- Improve Safety Awareness
Countermeasures

- Sidewalks
- Traffic signals
- Lighting
- Traffic calming
- Shorten crossings
- Medians

- Roundabouts
- Raised intersections
- Education
- Enforcement
Countermeasures

Before                   Seatac Washington           After

Before

Seatac Washington

After
Countermeasures
Countermeasure
Countermeasures
Pedestrian/Intersection Issues

Accessibility

Obstructions / Sight Distance
Pedestrian Tools

- Pedestrian Programs
  - Pedestrian Road Show
  - Pedestrian Work Zone Safety
  - Walk Your Child to School

- Other Tools
  - Safer Journey CD
Pedestrians

Emerging Technologies

Count Down Signal

Animated Eyes Display

In-Pavement Lighting
Run-Off-the-Road

**Warn**

**Remove**

**Relocate**

**Reduce Impact**

**Shield**

**Delineate**
Intersections

Red Light Running

Intersection Design

Roundabouts

Conflict Points
Pedestrians

Emerging Technologies

Pedestrian Road Show

Design
What Can I Do?
Remember

All this is done to

SAVE LIVES