

# *R*oad *S*afety *A*udits

## The Maine Experience

Presented by:  
Duane Brunell  
Safety Office  
MaineDOT

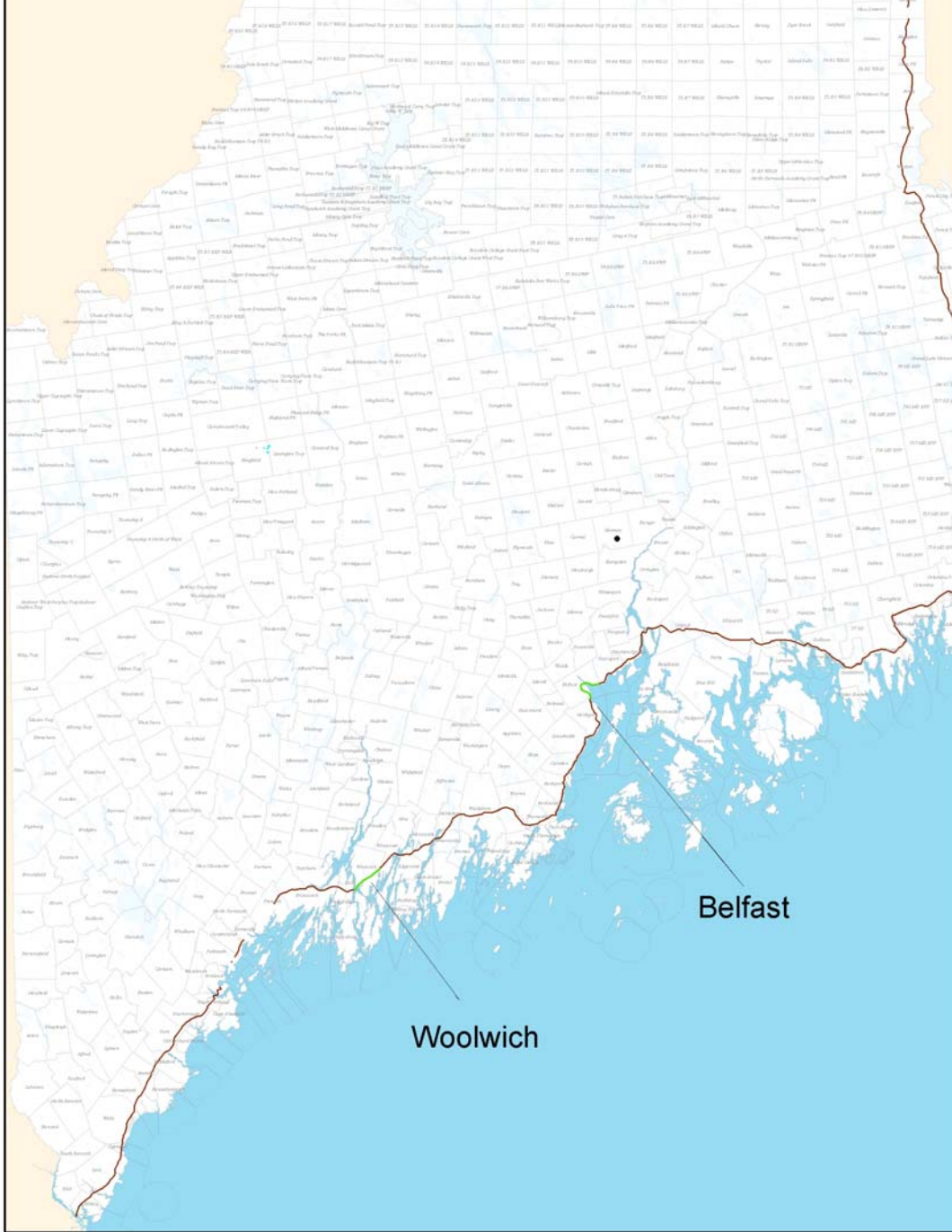
# Road Safety Audits

(or Assessments)

They are as 'easy' as

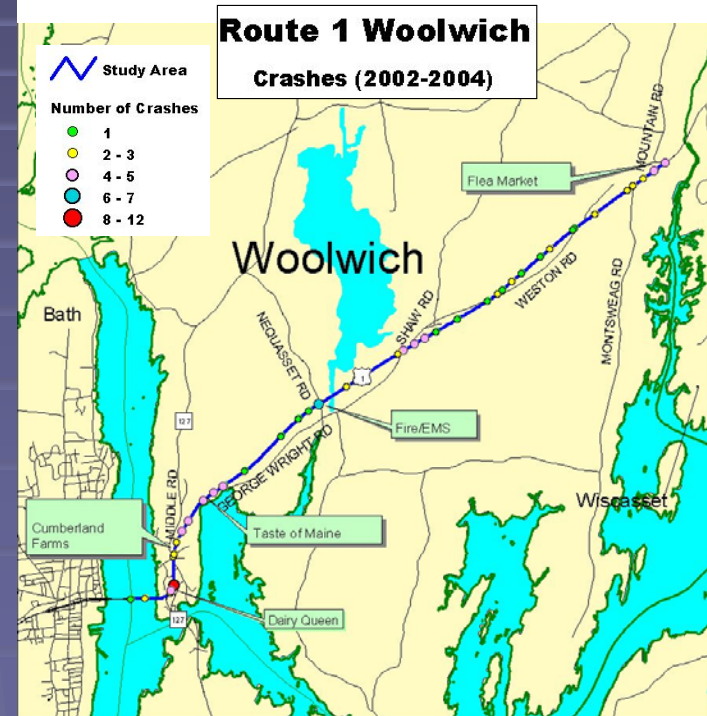
**“R-S-A”**

# Maine Experience



## Woolwich Route 1 Road Safety Audit Report September 23, 2005

Prepared by  
Duane Brunell, Safety Office, MaineDOT



# Rule # 1

Are you...

*R*eady to  
*S*tart  
*A*ction?

...tempered with...

*R*ealistic

*S*ales

*A*pproach

*R*ecruit  
*S*trategic  
*A*llies

## *Route 1, Woolwich: SAFETY AUDIT TEAM*

- *State Representative Carol Grose, House District 55*
- *Mark Westrum, Sagadahoc Sheriff's Department*
- *Dave Kloberdans, Road Committee Chair, Town of Woolwich*
- *Rita Sturtevant, Select Board Member, Town of Woolwich*
- *Ken Desmond, Emergency Response Services, Town of Woolwich*
- *Mike Davies, Federal Highway Administration*
- *Tom Granda, Federal Highway Administration*
- *Duane Brunell, MaineDOT Safety Office*
- *Kathy Fuller, MaineDOT, Gateway 1*
- *Chris Newton, MaineDOT, Gateway 1, Scribe*
- *Randy Dunton, MaineDOT Traffic Engineer, Region 1*
- *Elroy Russell, MaineDOT Maintenance & Operations*
  
- *RESOURCES*
- *Charlie Hebson, MaineDOT Hydrology Engineer*
  
- *For Belfast, we also had Bike and Pedestrian advocates*

*R*eally  
*S*imple  
*A*pproach



# RSA Work Flow

**Pre-Audit Meeting**  
(set parameters, get oriented)

**Field Audit**

**Group Info Processing**

**Report Write-up**

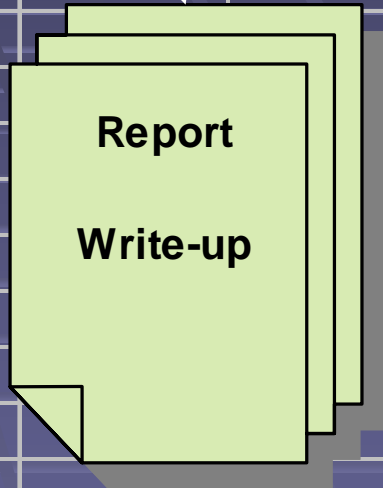
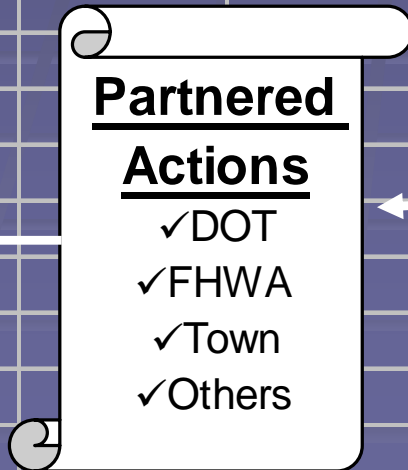
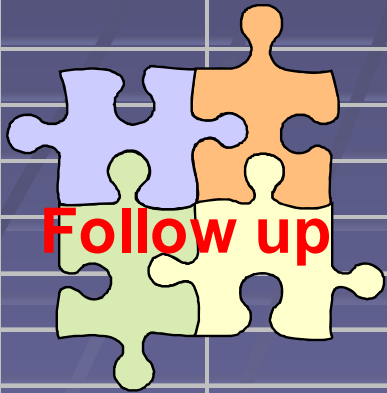
**Group Report Review/ Approval**

- ✓ Determine Immediate, Medium, or Long Term Opportunities
- ✓ Identify Priorities

**Partnered Actions**

- ✓DOT
- ✓FHWA
- ✓Town
- ✓Others

**Follow up**



# Pre-Meeting...

## It's time for orientation.

### INTERSECTIONS

Yes / No

- Has the possibility of removing unnecessary or non-essential intersections and providing access more safely by changes on the surrounding road network been considered?
- Has the potential of misinterpretation of traffic signals at closely spaced intersections been considered? (e.g., "seeing through" to other signal heads)
- Is the angle of the intersecting roads and the sight lines adequate for the safety of all road users?
- Is the movement of pedestrians and bicyclists safely accommodated at all intersections?
- Is the movement of heavy vehicles safely accommodated at all intersections?
- Is the number of lanes appropriate for safe operations and to accommodate variations in traffic patterns?

### INTERCHANGES

Yes / No

- Are the interchange types/layouts appropriate with respect to the broad concept of the project, function of the road and intersecting roads?
- Is the number of lanes appropriate for safe operations and to accommodate variations in traffic patterns?

### ENVIRONMENTAL CONSTRAINTS

Yes / No

- Is the surrounding terrain free of physical or vegetation elements which could affect the safety of the design? (e.g., heavy planting, forestry, deep cuttings, steep or rocky bluffs which constrain the design)
- Is consideration given to weather records or local experience that may indicate a particular problem? (e.g., snow, ice, wind, fog.)
- Will the design perform safely when there is a rain, mist, ice, fog, snowfall, blowing snow?
- Do the gradients, curves and general design approaches fit in with the likely weather and environmental aspects of the terrain? (e.g., fog-prone, icing-prone, blowing snow areas)
- Has the need for environmental devices been considered? (e.g., noise barriers)
- Are visual distractions (e.g., scenic vistas) adequately addressed (e.g., by providing areas to stop safely)?
- Has the issue of unstable land been considered (e.g., falling rock, mudflow, mine subsidence)

*Reinforce*  
*Safety*  
*Always*



# *R*equire *S*ecretarial *A*ssignment

Because you'll be noting many observations...

Look for the obvious...



...and the more subtle driver cues.



# Sensory overload?



# Understand Local Issues





*R*each  
significant  
*A*greement

*R*eport  
*S*tresses  
*A*lternatives

*R*eview  
significant  
*A*reas

# Route 1 safety audit sought

PPH 6.20.05

A review of a stretch of the highway in Woolwich safe. If the proposal is approved, it weekend. Esther Pecci, 70, of Bath wa

# Checking out Route 1's impact

PPH

6.21.05

## on motorists' minds

if a highway ever needed a number of sessions on a psychologist's couch, it's this one.

# MDOT conducts safety audit of Route 1 stretch in Woolwich

BY BOB KALISH  
Times Record Staff  
WOOLWICH

department representatives, highway truckers, pedestrians, and get Many of the options have been discussed during publi

# Woolwich Nixes MDOT Idea To Slow Down Traffic

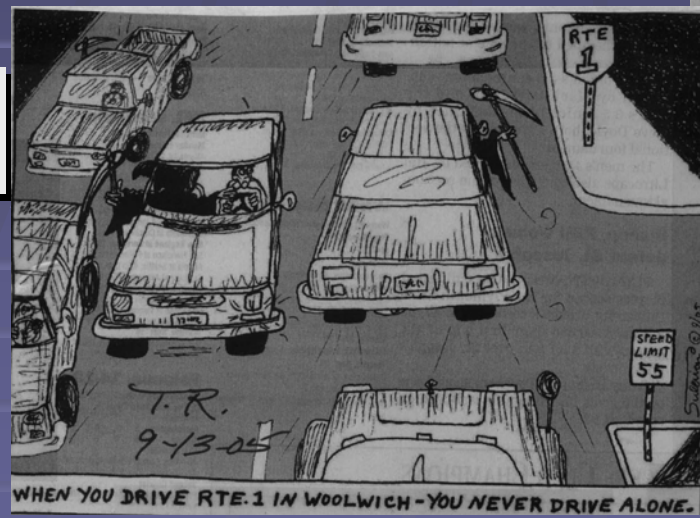
4-27-06

W.N.

# Reporters

# shall

# Ask



# Woolwich tells state: Fix the problem

TR 8-26-05

• Since 2002, there have been 88 crashes and at least 10 fatalities on dangerous stretch of Route 1.

BY BOB KALISH  
Times Record Staff

ate corrective safety measures.



# Woolwich

# 2 More Route 1 Accidents. Study Results Expected

8-25-05

W.N.

By CHARLO

Woolwich

# Governor Told About Dangerous Traffic Conditions

"This stretch of road is one of the most dangerous in the state."

David King, Woolwich Selectman

draft a letter to the Governor at their meeting two weeks ago.

The letter dated August 23, tells the governor there have been 88 Route 1 accidents since 2002, resulting in 92 injuries, with 10 fatalities.

stopped, but the car two back has very little reaction time and nothing is scarier than hearing the screech of the tires as they slide by you."

King also shared with the governor a story told to him by a waitress at the Tests of Maine Restaurant.

# Woolwich officials seek action, not words on Route 1

BY BOB KALISH

10/26/05

study is not the same as

# Woolwich "Death Zone" Makes Nightly News

WN

9.1.05

By CHARLOTTE BOYNTON

The Woolwich selectmen's meeting Monday night began with the viewing of the Channel 8 TV news report of the dangers on Route 1 in

Monday night and decided it would not be in the town's best interest to abandon the road.

However, Realtor Nancy Carleton came into the meeting a little later

*R*eport

*S*tructure

*A*necdotes

Woolwich Route 1  
Road Safety Audit Report  
September 23, 2005

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*R*eport  
should be  
*A*djustable

# Record Significant Achievements

## Appendix 1:

### Items discussed, but no longer considered a viable potential action

- Consider using a 2 + 1 configuration for 2 or 2.5 miles segments; alternating the direction of a 2nd lane; this creates occasional passing zones; at the transition areas use cable barriers or flush islands or other delineation for path. – r Results of this configuration show that although number of crashes goes up their severity goes down.; They are used in Europe; this reduces platooning; would have to eliminate a portion of the shoulder. This technique may not meet the objective of speed management but does eliminate the risks taken by those drivers frustrated by inability to pass. Opportunities for installation on this corridor are minimal, at best.
- Consider how a change to a stop sign at Route 127/ Cumberland Farms would impact Ferry Road.
- Use different color pavement to delineate the dedicated turn lanes.
- Determine what additional overhead signs are needed - Evaluate potential use of directional/lane use/driver feedback signs needed for northbound traffic.
- Replace existing truss between DQ and Cumberland Farms with new truss to allow for addition of northbound signage.
- Replace stop sign with yield at Rt. 127/Rt 1 S intersection, by Cumberland Farms. Possible downside is cars coming from Route 127 may not yield when car in front is doing so, causing rear car to push front car into south bound lane/cars.
- Add signage that indicates right lane on SB Rt. 1 exiting from Rt. 127 S is continuous.
- Consider use of sign that alerts drivers that Cumberland Farms exit is on curve
- If intersection at Rt. 127/1 at Cumberland Farms is to have a designated walking/crossing area, reconsider the proposed change of stop sign to yield sign.
- Define major intersections with striping.
- Use different color pavement to delineate the dedicated turn lanes.
- **At Mountain Rd.**
- cClose intersection and extend old Route 1 back; or
- mMove intersection further north

## Appendix 2:

### Completed Recommendations

- Review lane marking signs on Route 1 mast arm heading south; one indicating reverse direction sign is upside down
- Reverse order of Route 1 and Route 127N marking signs northbound, before Cumberland Farms.
- Provide pavement markings at Cumberland Farm driveways showing exit/entrance and allowed right hand turning movement.
- Upgrade flashing beacons from 1 per approach to 2 per approach with back plates – **3 locations** – Cumberland Farms, Nequassett Road and Mountain Road..
- Remove the pedestrian crossing sign on Route 1 southbound, before the Subaru dealer.
- Move route and lane use sign near the Subaru Dealer/Bath Cycle and Ski
- Consider installing larger 35 mph speed limit signs in vicinity of Taste of Maine/George Wright Road.
- Consider relocating northbound 35 mph speed limit sign to more visible locations (i.e. south of driveway in front of pole). This is northbound, just south of Taste of Maine.
- MaineDOT coordinated with USGS to install a permanent tide stage gage (installed this past November and will remain for the foreseeable future to continue tidal evaluations) and is part of real-time network tied to Internet. A “trigger level” for automatic warning has been determined. This permanent station will provide critical data for any future hydrology/hydraulics (H/H) modeling study to support a highway project. MaineDOT should purchase several portable/temporary stage recorders that could be deployed in the marsh and at the upstream railroad culvert in March and removed in November each year. MaineDOT can run these temporary gages.
- Evaluate the benefit of raising the boat ramp and other sections compromised in the existing berm. **Breach has been temporarily repaired and so far has been effective and suggests that a more permanent repair of all damaged dike sections will produce significant improvements. (partial completion). A MaineDOT project is well underway to make a permanent fix at the boat launch.**
- For better visibility of Route 1 from Mountain Road, cut brush at Montsweag Restaurant side.
- Re-install stop sign at Mountain Road to minimum meet ground clearance.
- Installed vertical tubular delineators at Dairy Queen, Route 127 (Cumberland Farms) and Taste of Maine to better control left turns and as a traffic calming measure.





Woolwich	D I W TAPE
US 1	"YY/MM/DD" 2007
87.835	02/05/22 72342



Location and Geographic Area  
 Link ID = 225012  
 Route = 0001X  
 Milepoint = 87.835  
 Woolwich,  
 Sagadahoc County  
 Maintenance Division 5

Roadway Identification  
 Jurisdiction = State hwy  
 Nat. Hwy System = NHS - Other  
 Fed. Func. = Other princ arterial  
 Fed. Urban Rural = Rural  
 Street Name = US RTE 1

Road Use  
 Factored AADT = 17730  
 Speed Limit = 55  
 Left Shoulder = 10 ft. Paved  
 Right Shoulder = 2 ft. Paved  
 Number of Lanes = 2  
 Through Lane Width = 24 ft.

Pavement Conditions  
 Inventory Year = 2004  
 PCR = 4.75  
 Rut Depths = 0.1 in. 0.1 in.  
 Roughness = 51  
 PMS Route = PMS 0650M DIV 5

Vehicle Direction F

Frame Delay

Select New Route ?

**Road Level View- Intersection of Route 1 & Nequasset Rd, Woolwich, Maine**



Route 1 & Nequasset Rd, Woolwich, Maine  
Aerial showing surrounding exposures



U.S. Rte 1

NEQUASSET RD.

Duratherm Flush Island

LEGEND

 Raised Island

 Flush Concrete Island



Honeycomb Textured White Pavement Marking

WOOLWICH

U.S. Rte 1 and NEQUASSET ROAD



# Policies & Procedures in Maine

- No formal policy – see all the considerations above
- Written RSA Process
- RSA Checklist (used as a resource to address various exposures)
- RSA Process Flow Chart
- Report Templates

... *in summary*...

# *R*ight tool?

- *Sometimes*
- Full corridor
- Holistic
- Comprehensive
- Cooperative

... *in summary*...

# Strains

- Time intensive
- Creates high level expectations
- Partnering
- A Work in progress

... *in summary*...

# Acclaims

- High Visibility
- Drives process
- Maintains continuum
- Win-Win



*R*eliquish  
speaking to  
*A*udience