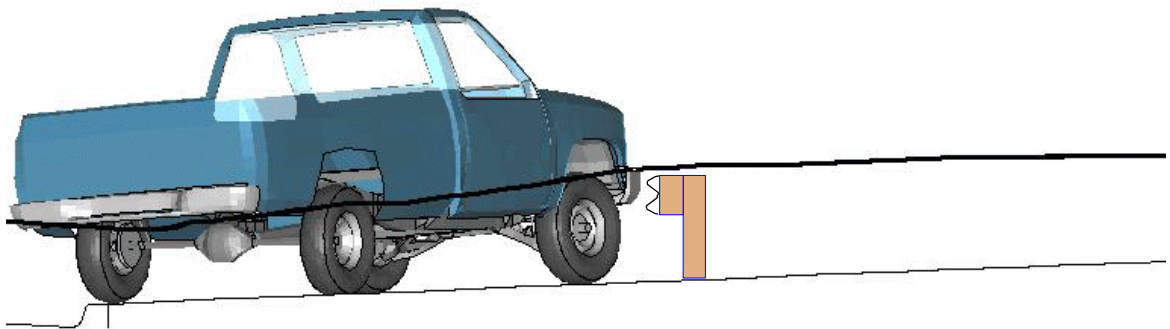


APPENDIX A

Bumper Trajectory Plots Measured at Top, Right Corner of Vehicle Bumper (Impact Side)

-Finite Element Analysis Results-



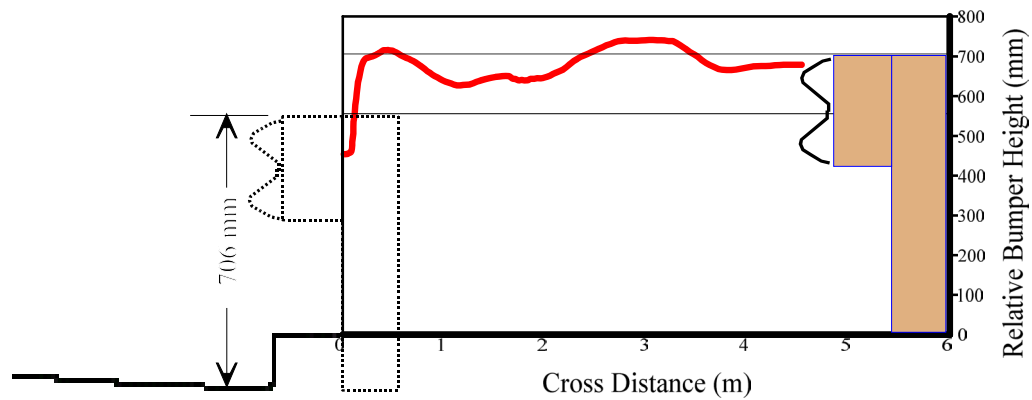


Figure A.1: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO A Curb
 Impact Speed -- 70 km/hr
 Impact Angle -- 5 degrees.

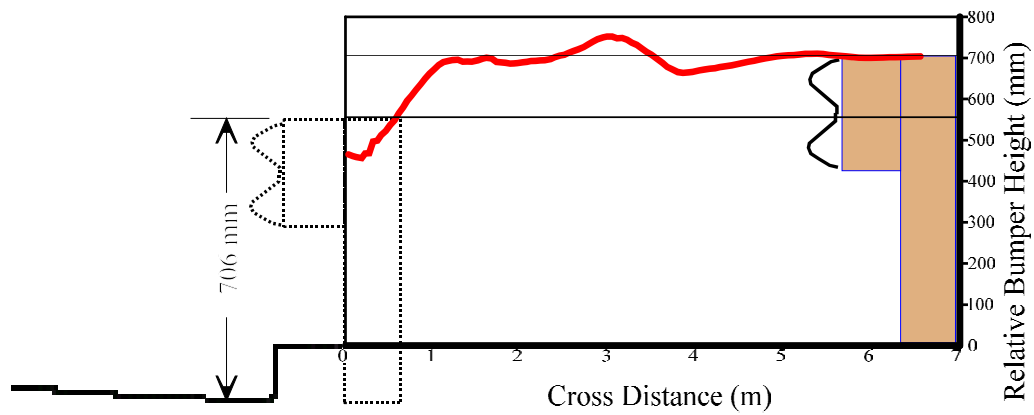


Figure A.2: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO A Curb
 Impact Speed -- 70 km/hr
 Impact Angle -- 15 degrees.

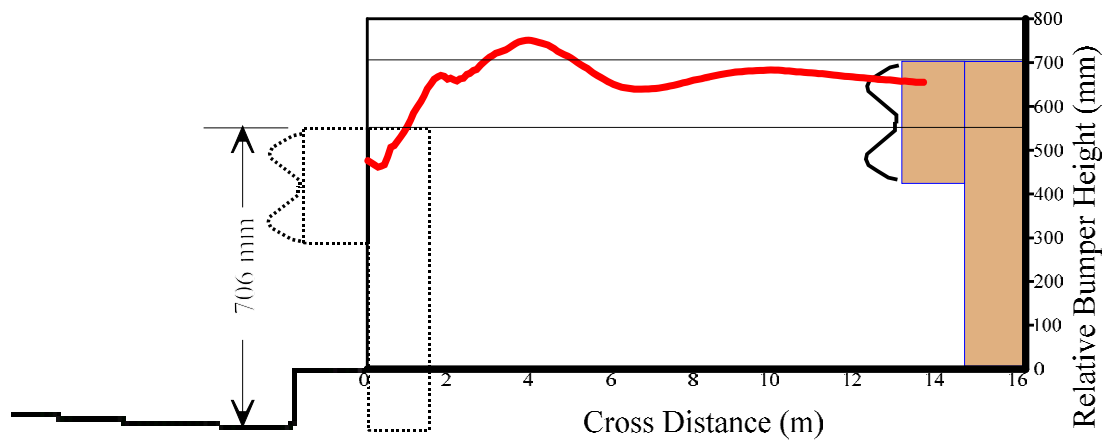


Figure A.3: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO A Curb
Impact Speed -- 70 km/hr
Impact Angle -- 25 degrees.

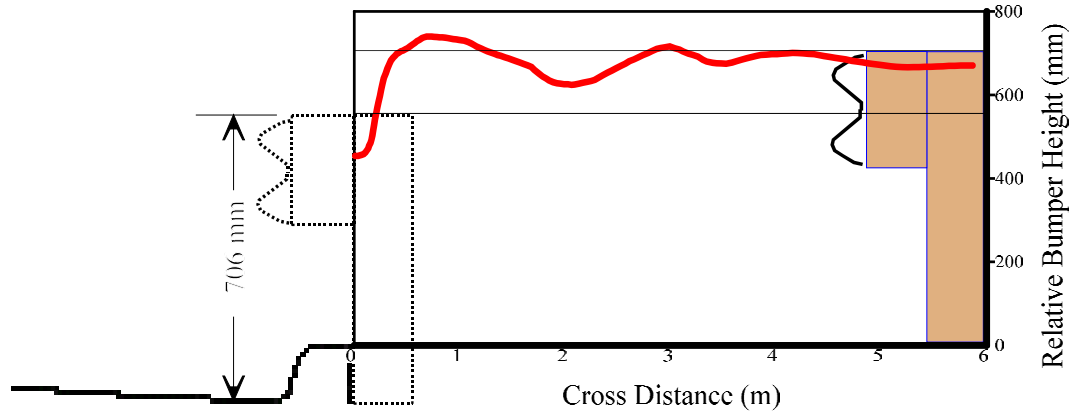


Figure A.4: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO B Curb
Impact Speed -- 70 km/hr
Impact Angle -- 5 degrees.

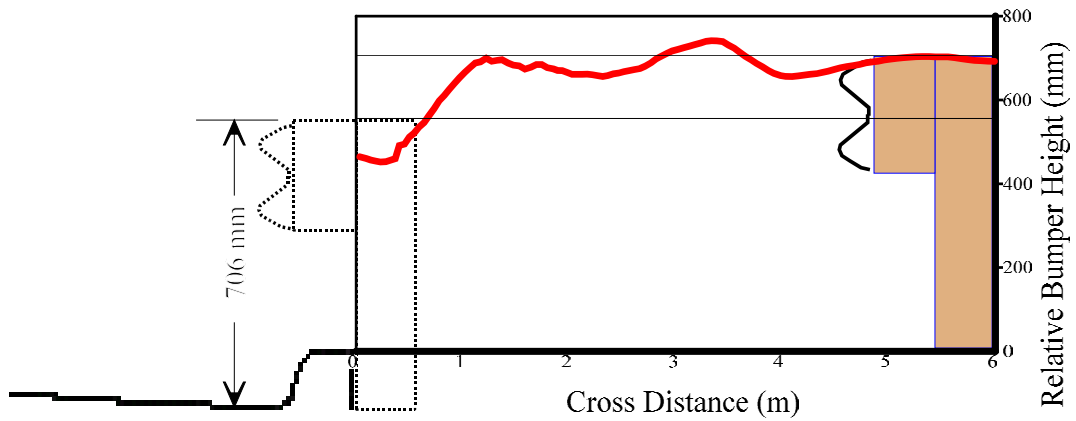


Figure A.5: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO B Curb
Impact Speed -- 70 km/hr
Impact Angle -- 15 degrees.

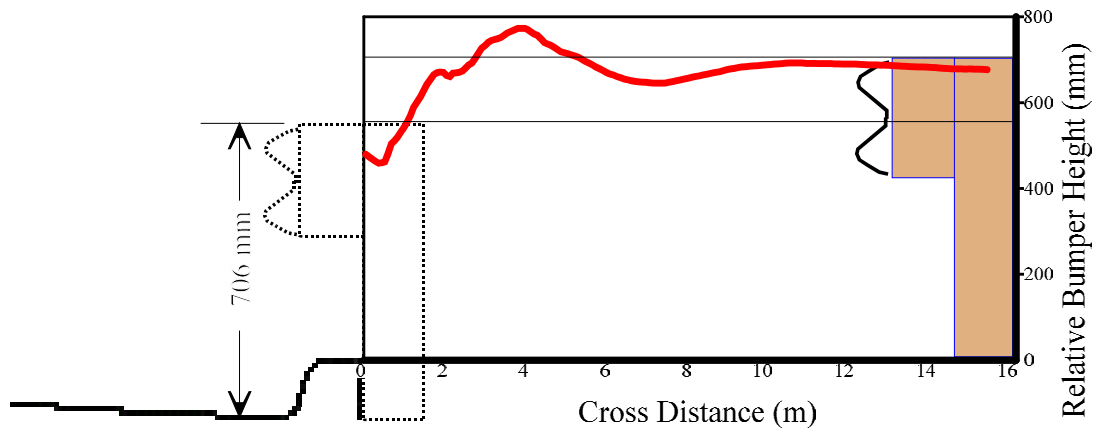


Figure A.6: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO B Curb
Impact Speed -- 70 km/hr
Impact Angle -- 25 degrees.

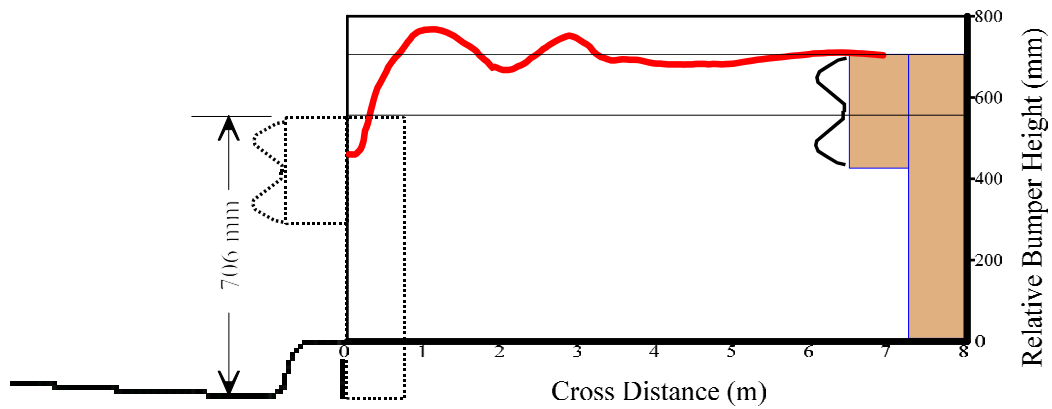


Figure A.7: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO B Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 5 degrees.

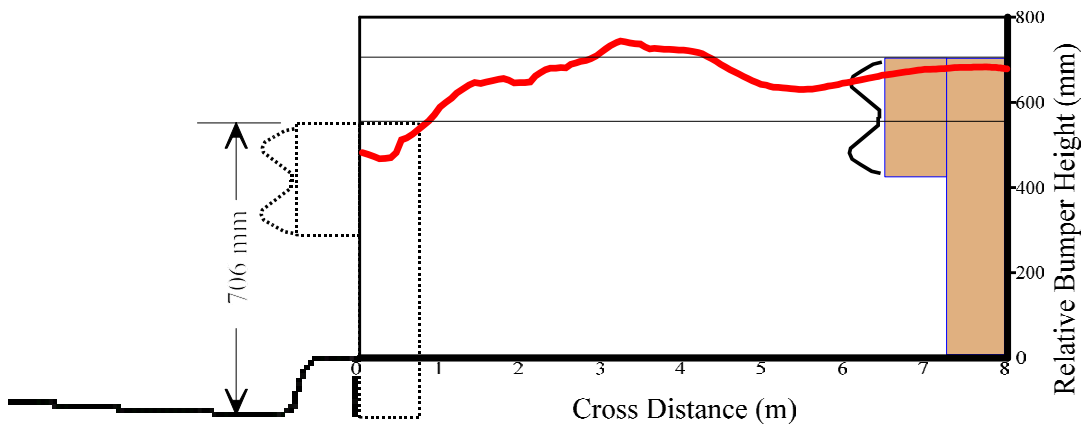


Figure A.8: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO B Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 15 degrees.

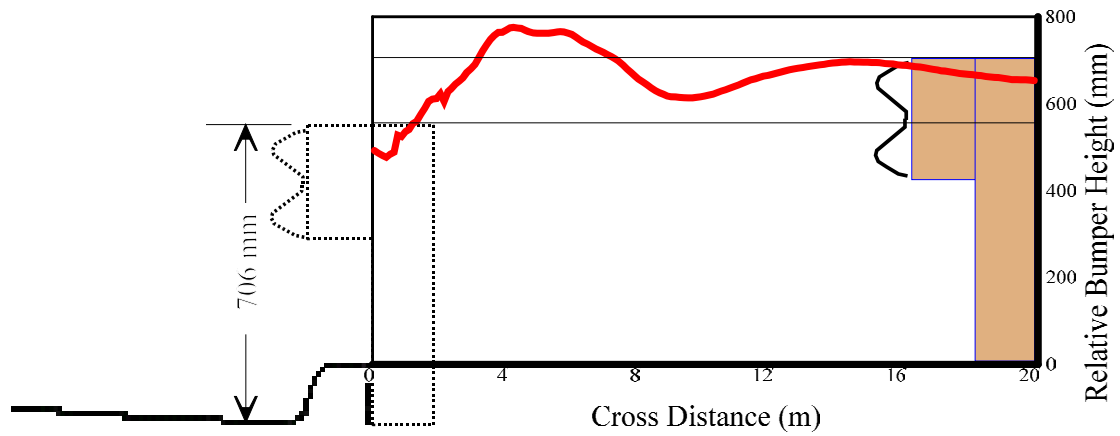


Figure A.9: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO B Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 25 degrees.

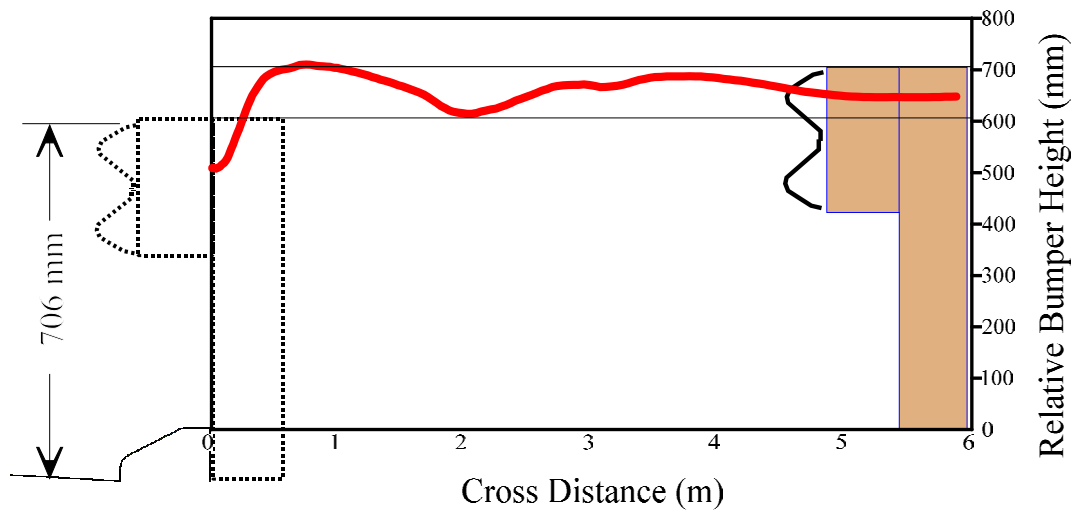


Figure A.10: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO C Curb
 Impact Speed -- 70 km/hr
 Impact Angle -- 5 degrees.

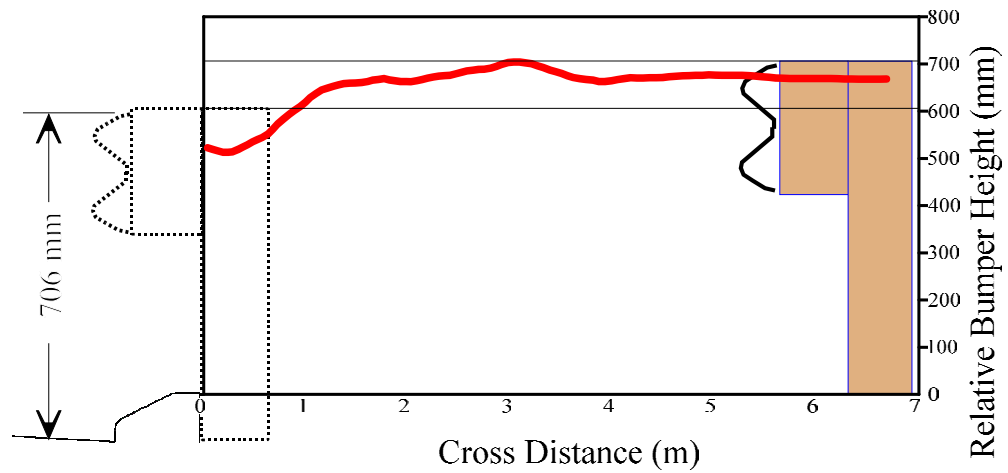


Figure A.11: Bumper trajectory at top of bumper on impact side:

Curb Type -- AASHTO C Curb
Impact Speed -- 70 km/hr
Impact Angle -- 15 degrees.

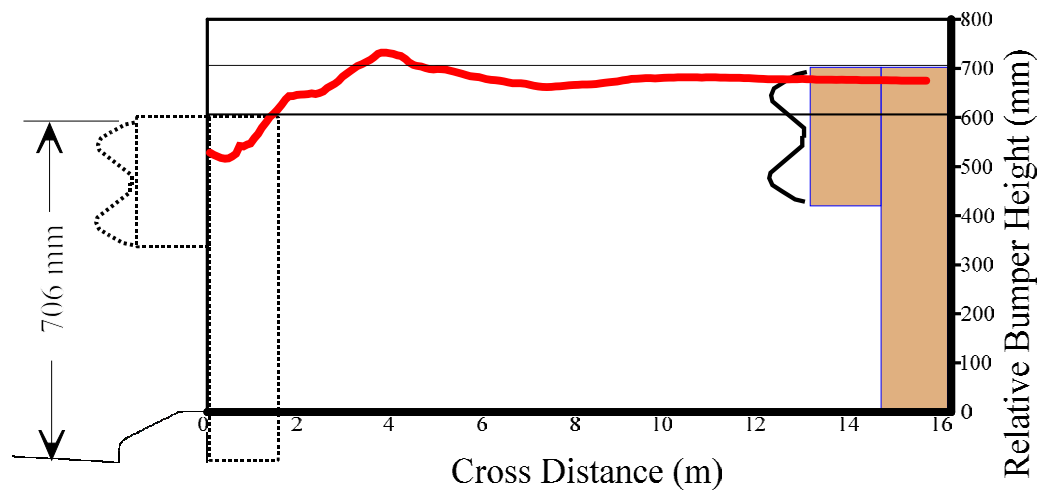


Figure A.12: Bumper trajectory at top of bumper on impact side:

Curb Type -- AASHTO C Curb
Impact Speed -- 70 km/hr
Impact Angle -- 25 degrees.

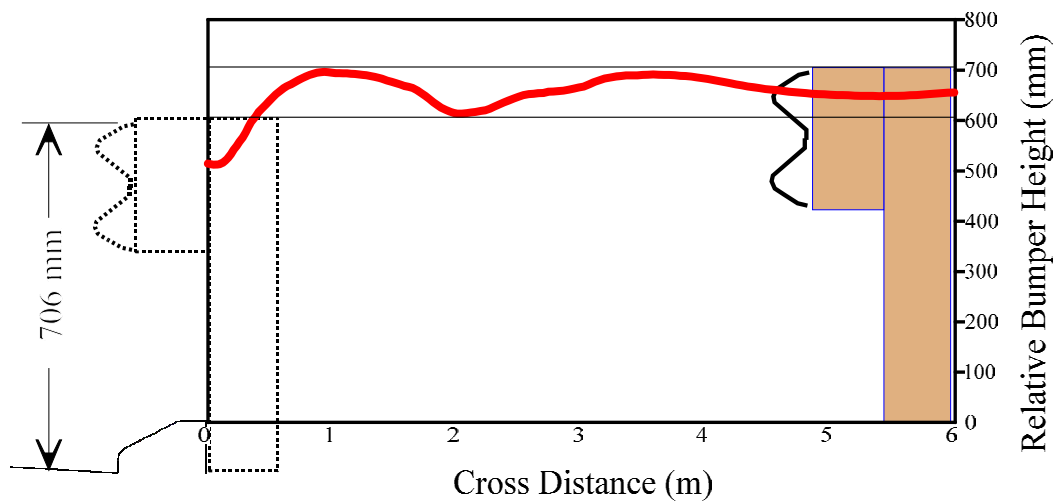


Figure A.13: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO C Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 5 degrees.

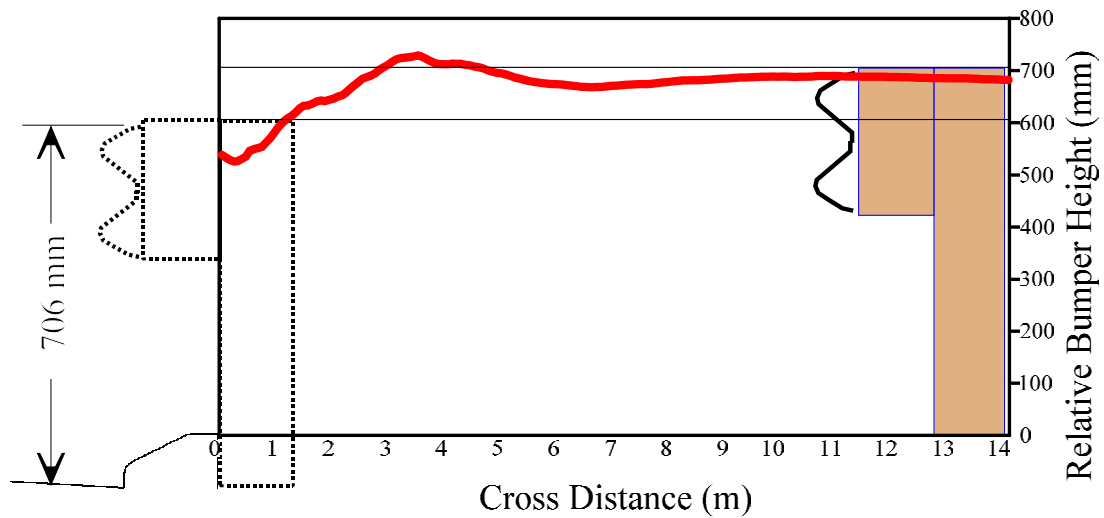


Figure A.14: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO C Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 15 degrees.

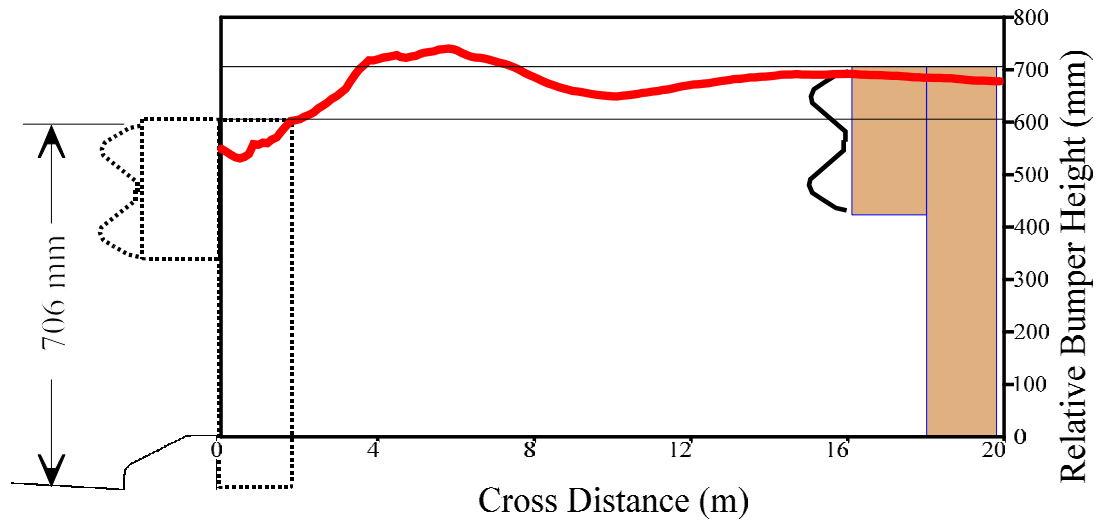


Figure A.15: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO C Curb
Impact Speed -- 100 km/hr
Impact Angle -- 25 degrees.

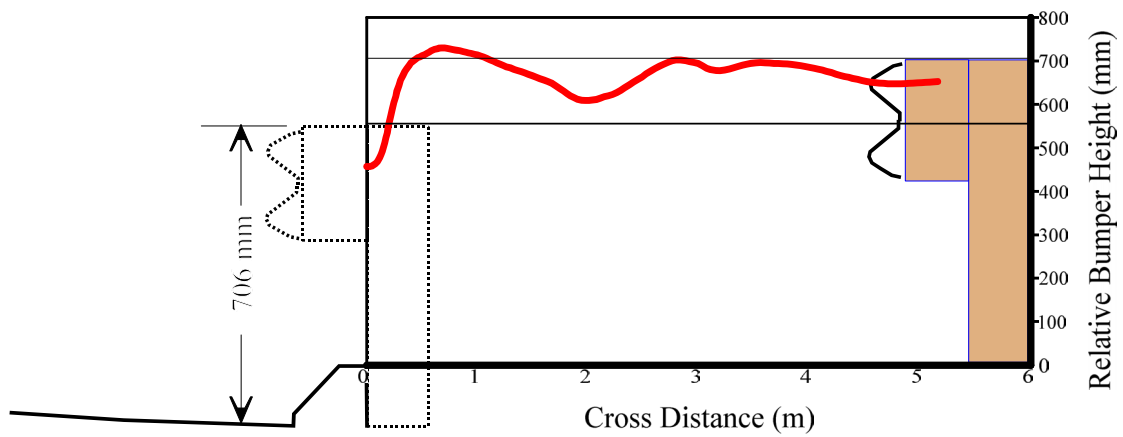


Figure A.16: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO D Curb
Impact Speed -- 70 km/hr
Impact Angle -- 5 degrees.

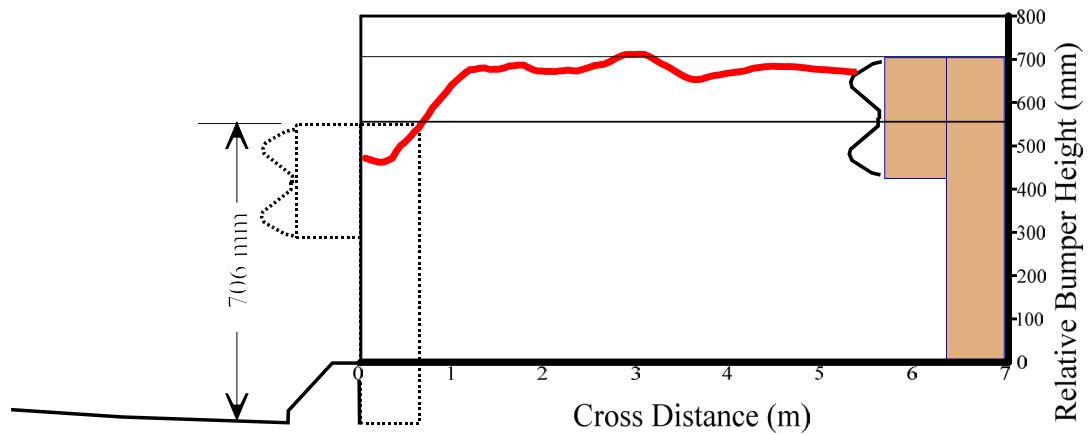


Figure A.17: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO D Curb
Impact Speed -- 100 km/hr
Impact Angle -- 15 degrees.

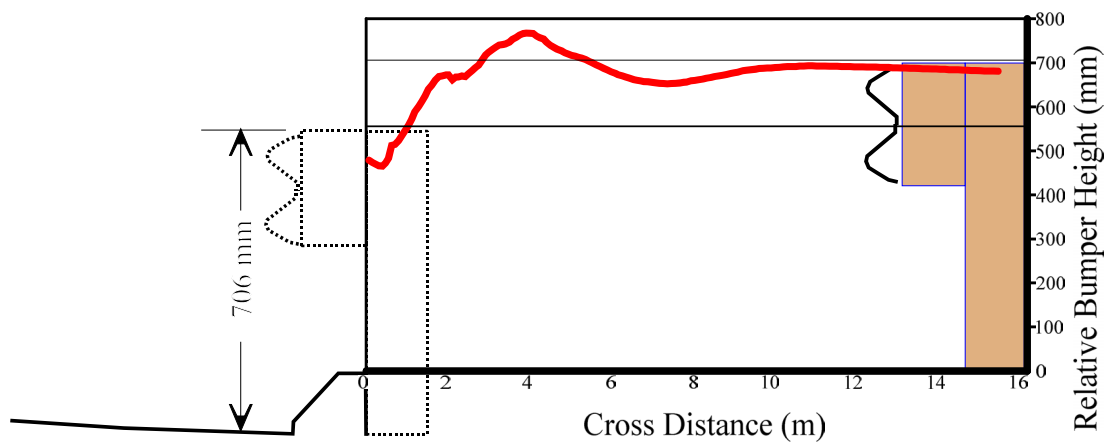


Figure A.18: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO D Curb
Impact Speed -- 70 km/hr
Impact Angle -- 25 degrees.

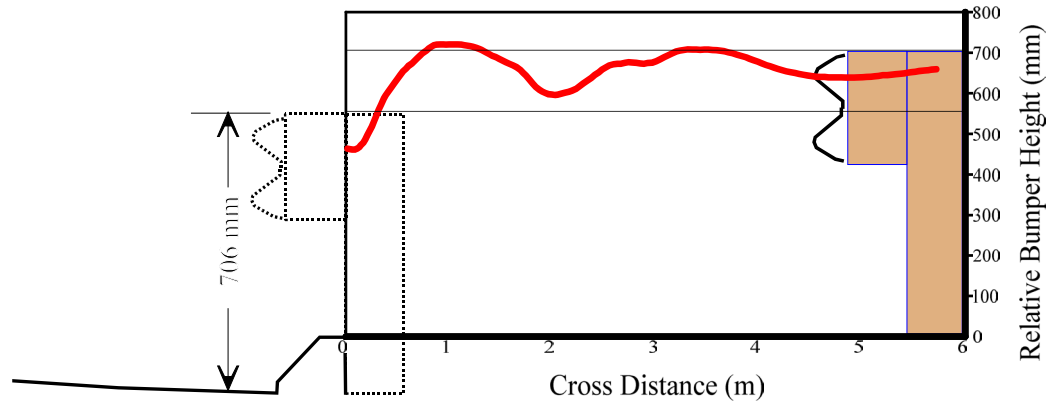


Figure A.19: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO D Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 5 degrees.

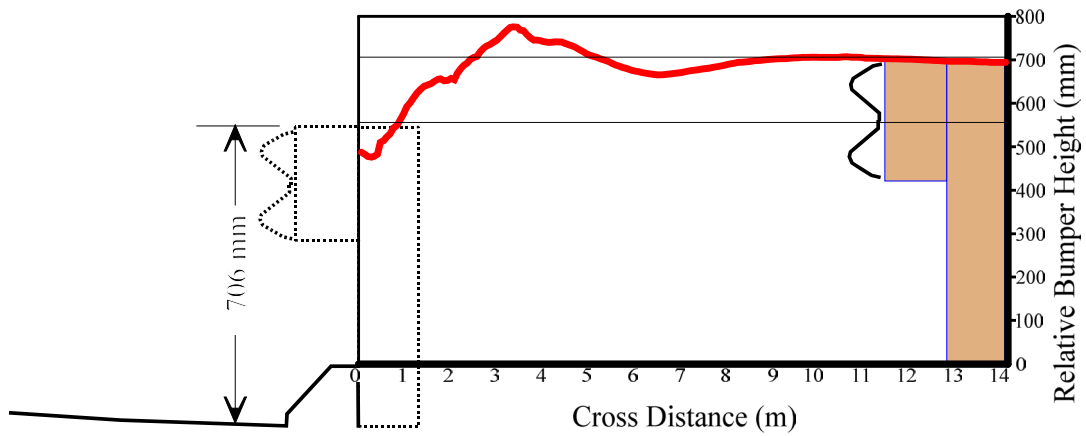


Figure A.20: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO D Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 15 degrees.

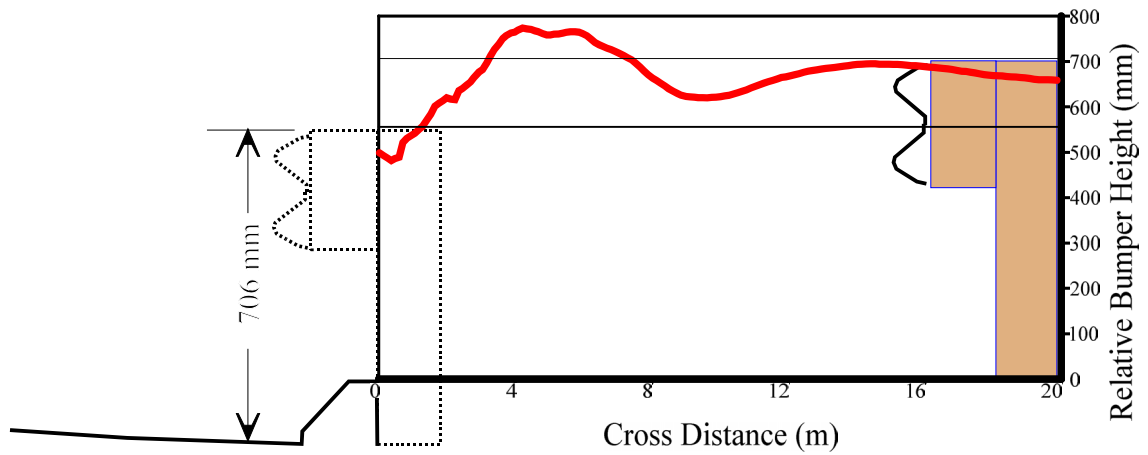


Figure A.21: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO D Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 25 degrees.

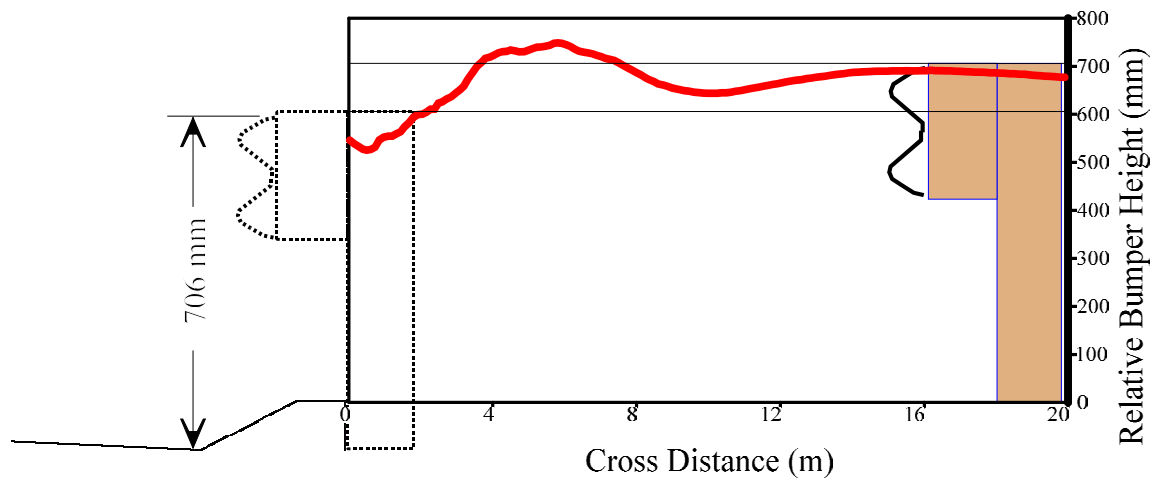


Figure A.22: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO G Curb
 Impact Speed -- 70 km/hr
 Impact Angle -- 5 degrees.

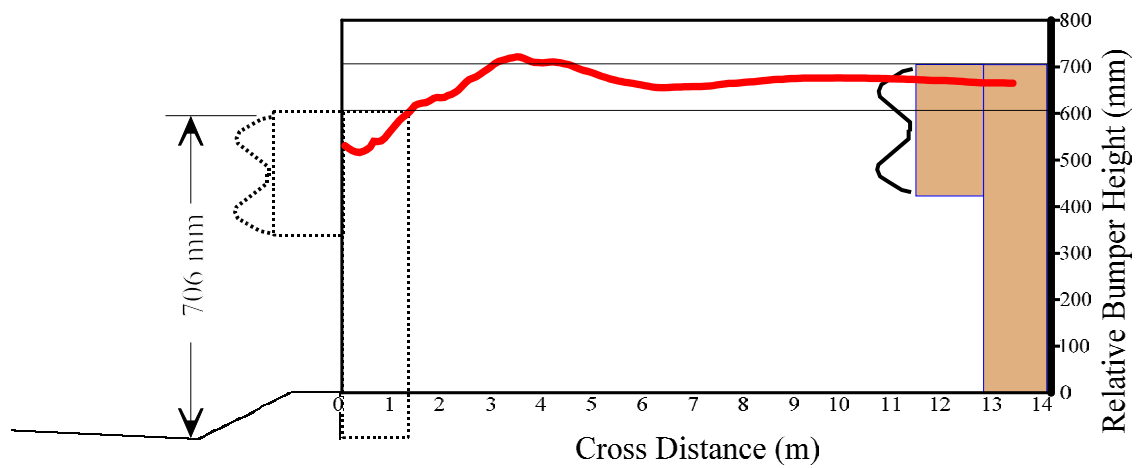


Figure A.23: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO G Curb
 Impact Speed -- 70 km/hr
 Impact Angle -- 15 degrees.

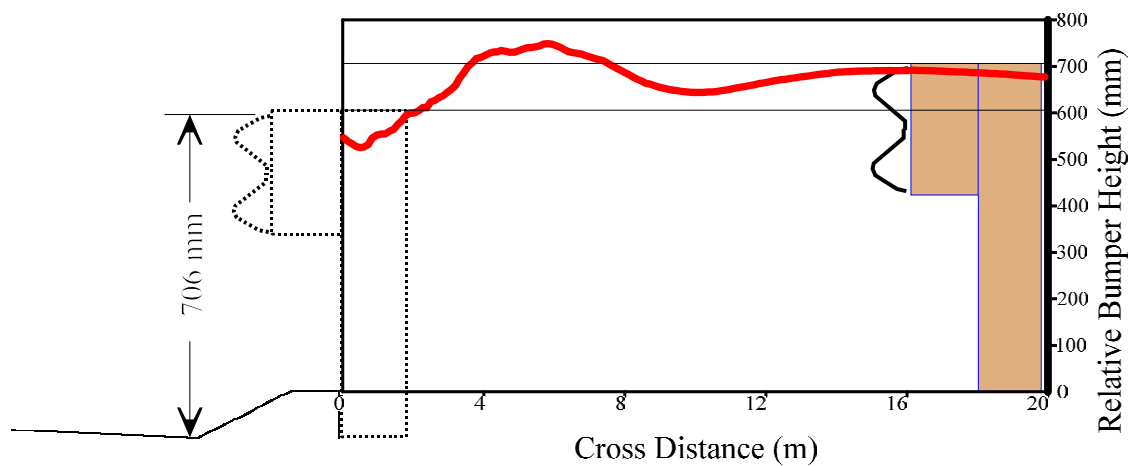


Figure A.24: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO G Curb
 Impact Speed -- 70 km/hr
 Impact Angle -- 25 degrees.

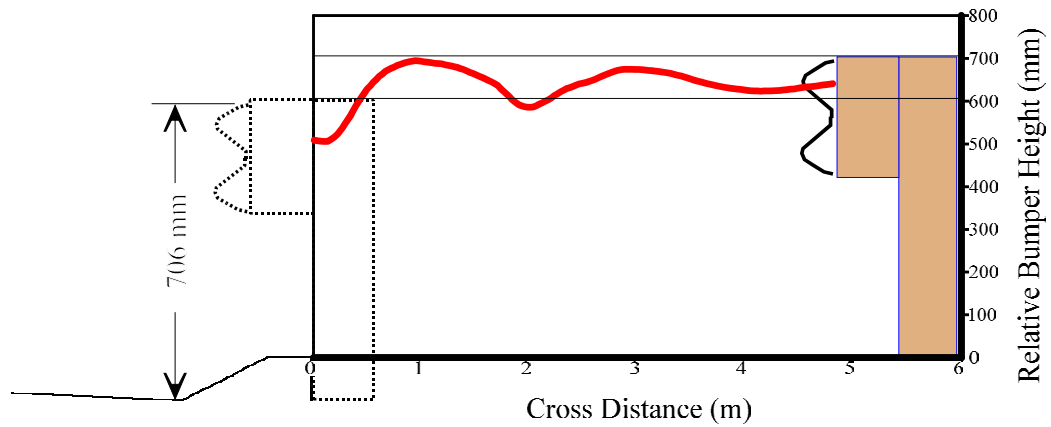


Figure A.25: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO G Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 5 degrees.

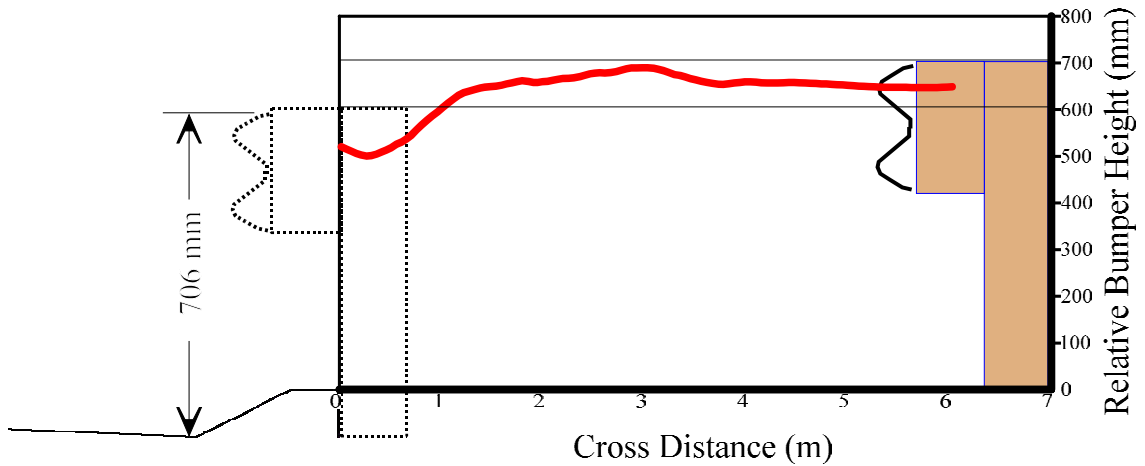


Figure A.26: Bumper trajectory at top of bumper on impact side:
 Curb Type -- AASHTO G Curb
 Impact Speed -- 100 km/hr
 Impact Angle -- 15 degrees.

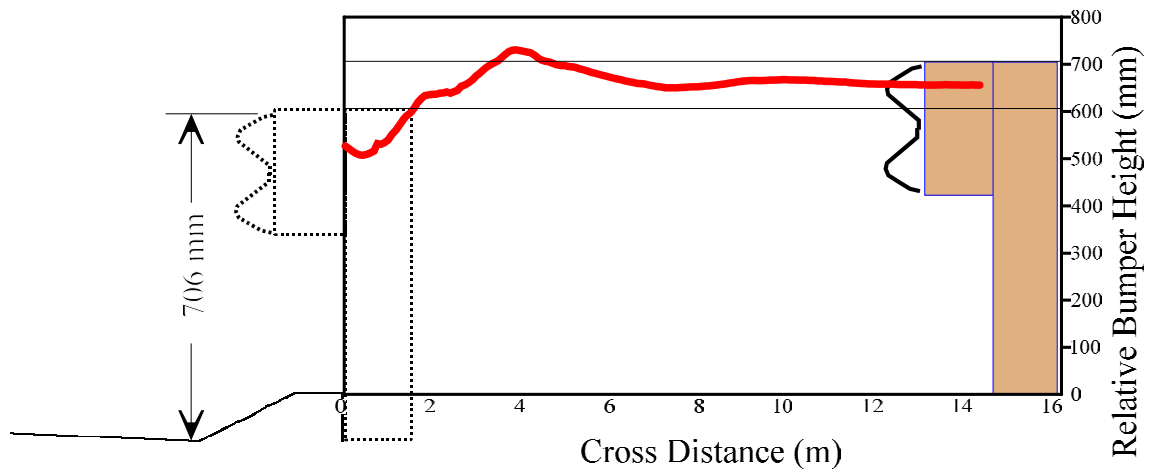


Figure A.27: Bumper trajectory at top of bumper on impact side:
Curb Type -- AASHTO G Curb
Impact Speed -- 100 km/hr
Impact Angle -- 25 degrees.

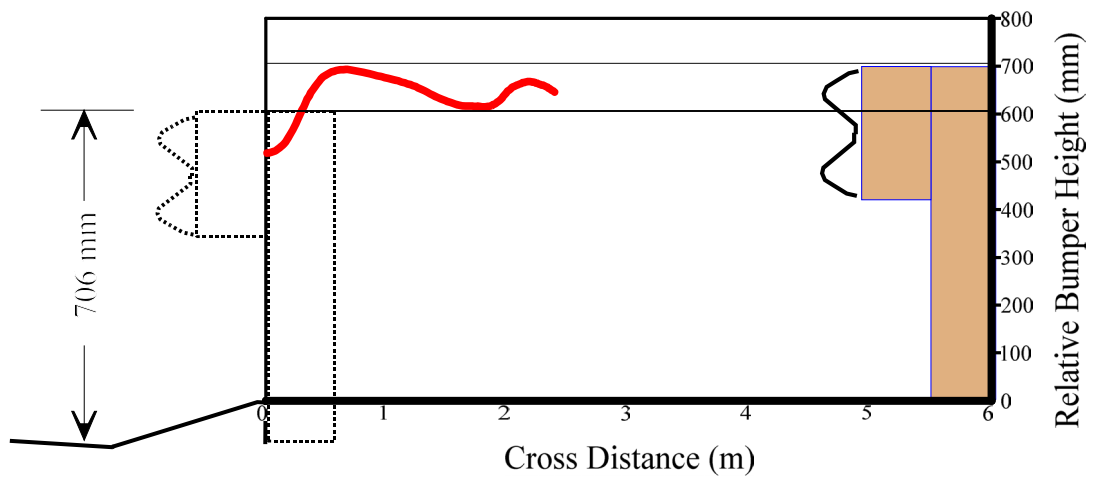


Figure A.28: Bumper trajectory at top of bumper on impact side:
Curb Type -- New York Curb (100 mm)
Impact Speed -- 70 km/hr
Impact Angle -- 5 degrees.

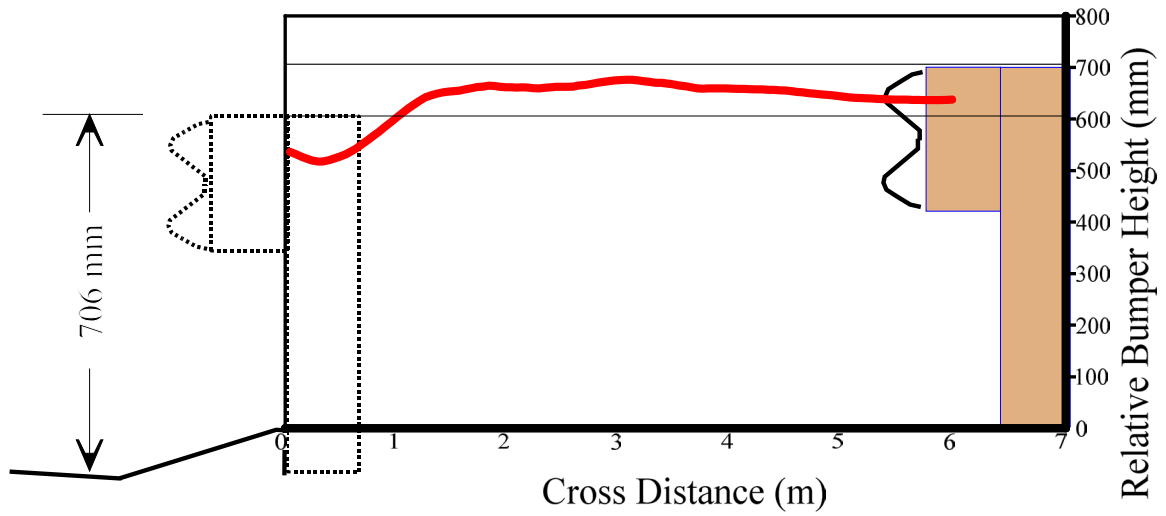


Figure A.29: Bumper trajectory at top of bumper on impact side:
 Curb Type -- New York Curb (100 mm)
 Impact Speed -- 100 km/hr
 Impact Angle -- 15 degrees.

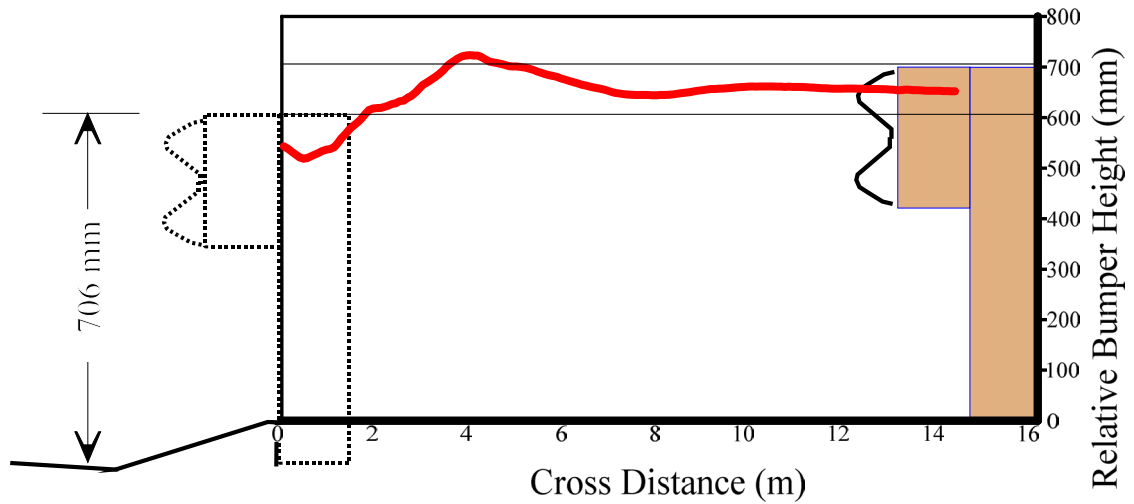


Figure A.30: Bumper trajectory at top of bumper on impact side:
 Curb Type -- New York Curb (100 mm)
 Impact Speed -- 70 km/hr
 Impact Angle -- 25 degrees.

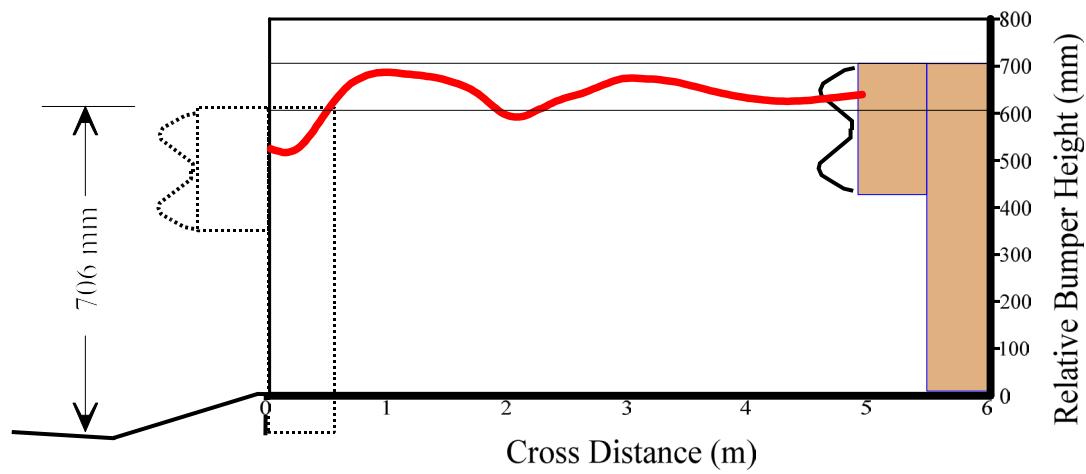


Figure A.31: Bumper trajectory at top of bumper on impact side:
 Curb Type -- New York Curb (100 mm)
 Impact Speed -- 100 km/hr
 Impact Angle -- 5 degrees.

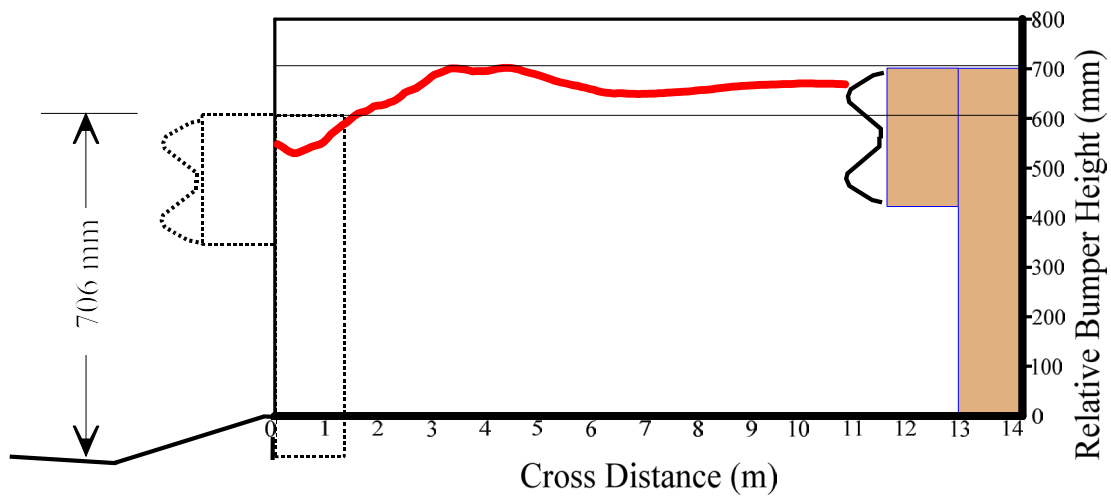


Figure A.32: Bumper trajectory at top of bumper on impact side:
 Curb Type -- New York Curb (100 mm)
 Impact Speed -- 100 km/hr
 Impact Angle -- 15 degrees.

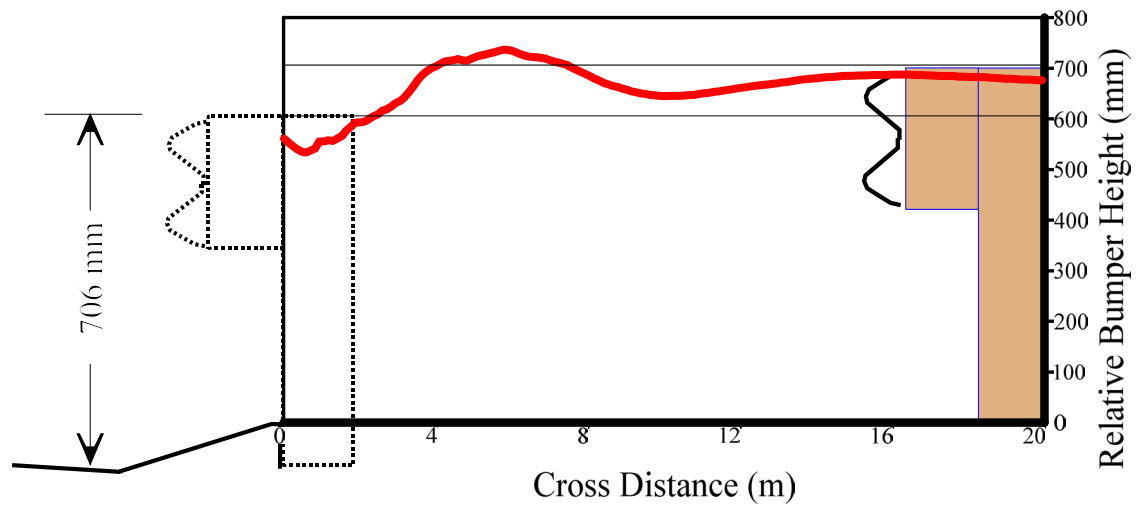


Figure A.33: Bumper trajectory at top of bumper on impact side:
Curb Type -- New York Curb (100 mm)
Impact Speed -- 100 km/hr
Impact Angle -- 25 degrees.