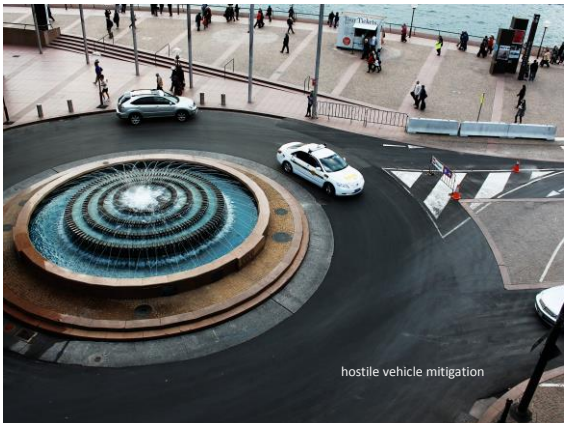




terrorist target?



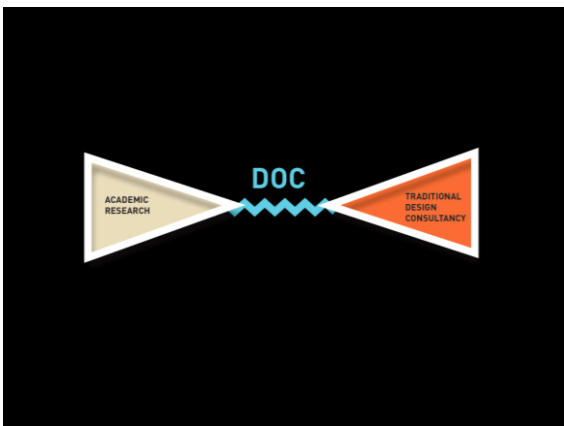
terrorist target?



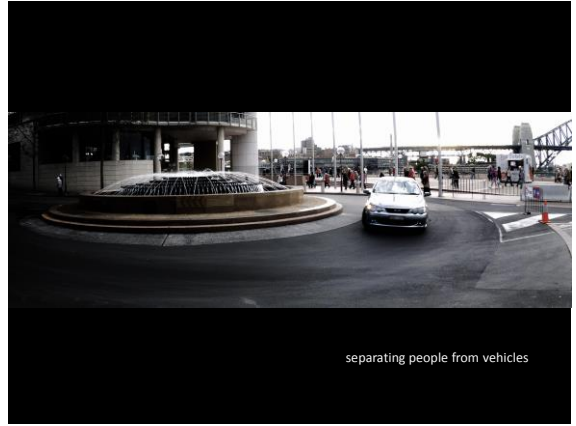
hostile vehicle mitigation



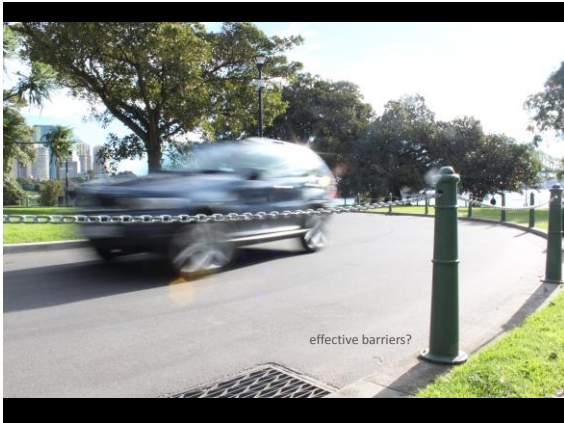
Designing Out Crime Research Centre University of Technology Sydney



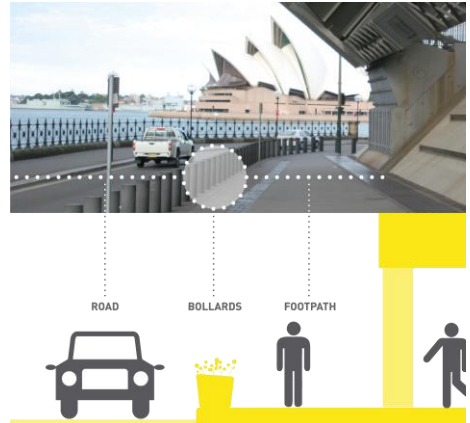
SAFE PLACES Vehicle Management A COMPREHENSIVE GUIDE FOR OWNERS, MANAGERS AND DESIGNERS



separating people from vehicles



effective barriers?



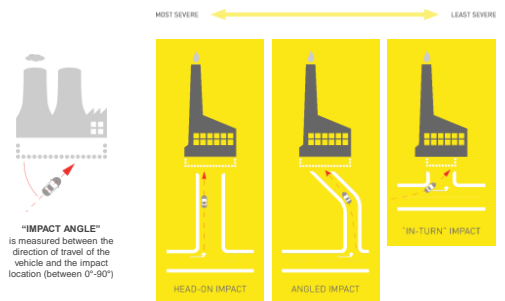
ROAD

BOLLARDS

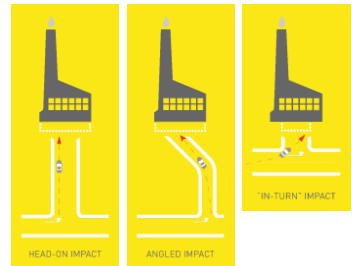
FOOTPATH



temporary barriers



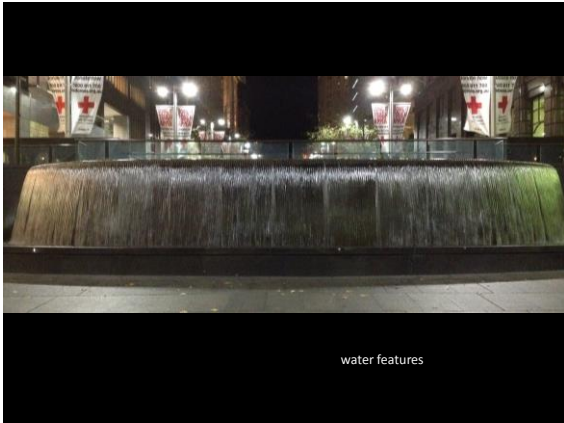
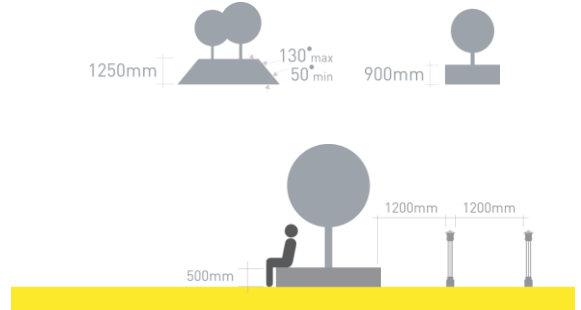
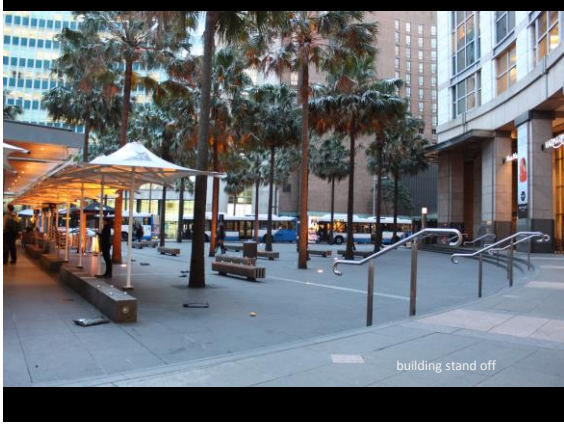
"IMPACT ANGLE" is measured between the direction of travel of the vehicle and the impact location (between 0°-90°)

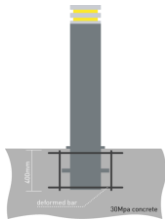


HEAD-ON IMPACT

ANGLED IMPACT

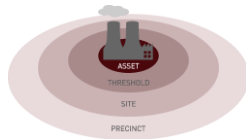
"IN-TURN" IMPACT



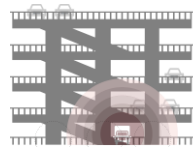
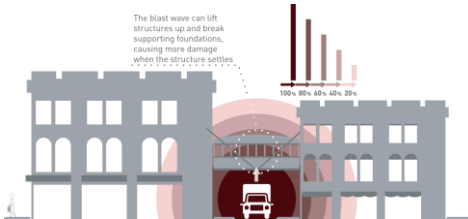


VSB foundations around underground services  
CPNI 2010

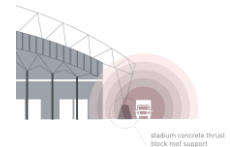
**STANDARDS:**  
BSI PAS 68 relates to the device itself and the volume of kinetic energy it can absorb 'impact capacity'.  
BSI PAS 69 relates to guidance for the selection, installation and use of vehicle security barriers.



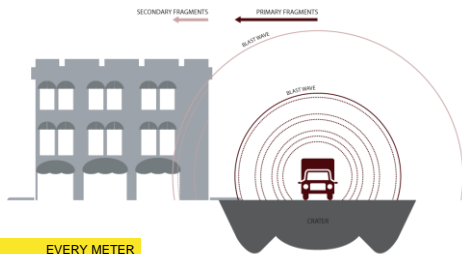
**LAYERS OF SECURITY**



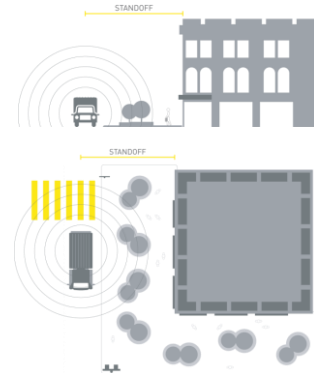
**INTERNAL**  
Building core (underground car park)



**EXTERNAL**  
Exposed columns  
Facades (masonry and glass)

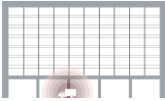


**EVERY METER COUNTS**

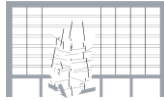


*"Progressive collapse results from the failure of one structural component and leads to the failure of one or more further structural components" (Starossek 2009)*

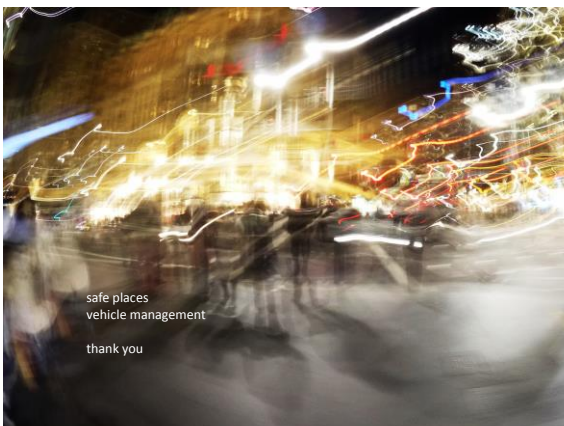
OKLAHOMA CITY BOMBING OF 1995, the Alfred P. Murrah Federal Building collapsed after a truck bomb attack.



**EXPLOSION**  
Parked truck takes out a single main column.



**COLLAPSE**  
The structure was not able to redistribute the force carried by that column to the neighbouring main columns.



safe places  
vehicle management  
thank you