Landscape Architecture + Bullet-Proof Vest= Land Vest

Exploring the relationship between
Landscape Architecture and School Safety

Location:
Santiago High School, Garden Grove, CA

About:

The genesis of Land Vest began with a conversation I once had with myself.
A conversation that begged to see the world through a set of unfiltered lenses;
a conversation that begged to make sense of the social inequalities and complex issues
people face today; a conversation about the safety of children.

Land Vest is about this conversation, one that is deeply rooted in the complex issue of school safety and the development of safer landscapes. What will be our role? The evolution of landscape architecture will depend on how well we can wipe the dirt off our lenses in order to see the bigger picture. Beyond the threshold of aesthetics form and function lies the deep human compassion innate in all of us to design for the social welfare of people. It is when we take a step back that we realize we are nothing but a piece of the microcosm; an integral piece that shapes the contours of the land, our history and our future.

Project Identity:

The intent of this project is to explore the relationship between our profession and school safety, with the ultimate goal of shedding new light on this complex issue. Through an exploration of historical elements, data analysis, case studies, and current safety recommendations the objective is to identify trends and explore, new innovative ideas that seek to defy the status quo in order to design safe(r) schools.

We, landscape architects are part of the bigger picture-a microcosm composed of imaginitive forward thinking individuals ready to tackle the challenges of our era, if we but only wipe the dirt off our eyes, if we but only have a conversation.

Significance:

Beginning, with the tragic school shooting at Columbine in 1999, school shootings have more than doubled in the last 15 years nationwide. At a regional level, California has experienced 14 school shootings where two or more students were either injured or killed due to gun violence. In 2013, a record high of 13 school shootings transpired, making it the most violent year on record.

The importance of Land Vest is to seek, to inquire to question what we perceive as safe school campuses. The objective of this project is to further analyze exisiting design paradigms and the multiple, psychological and physical dimensions that the profession provides the public with. Understanding the formerly mentioned is key. What makes this project unique is that it dives into exploring new planting arrangements, selecting plant pallettes that adhere to Crime Prevention Through Environmental Design (CPTED) recommendations, while integrating existing and forward thinking ideas into proposed future school designs.

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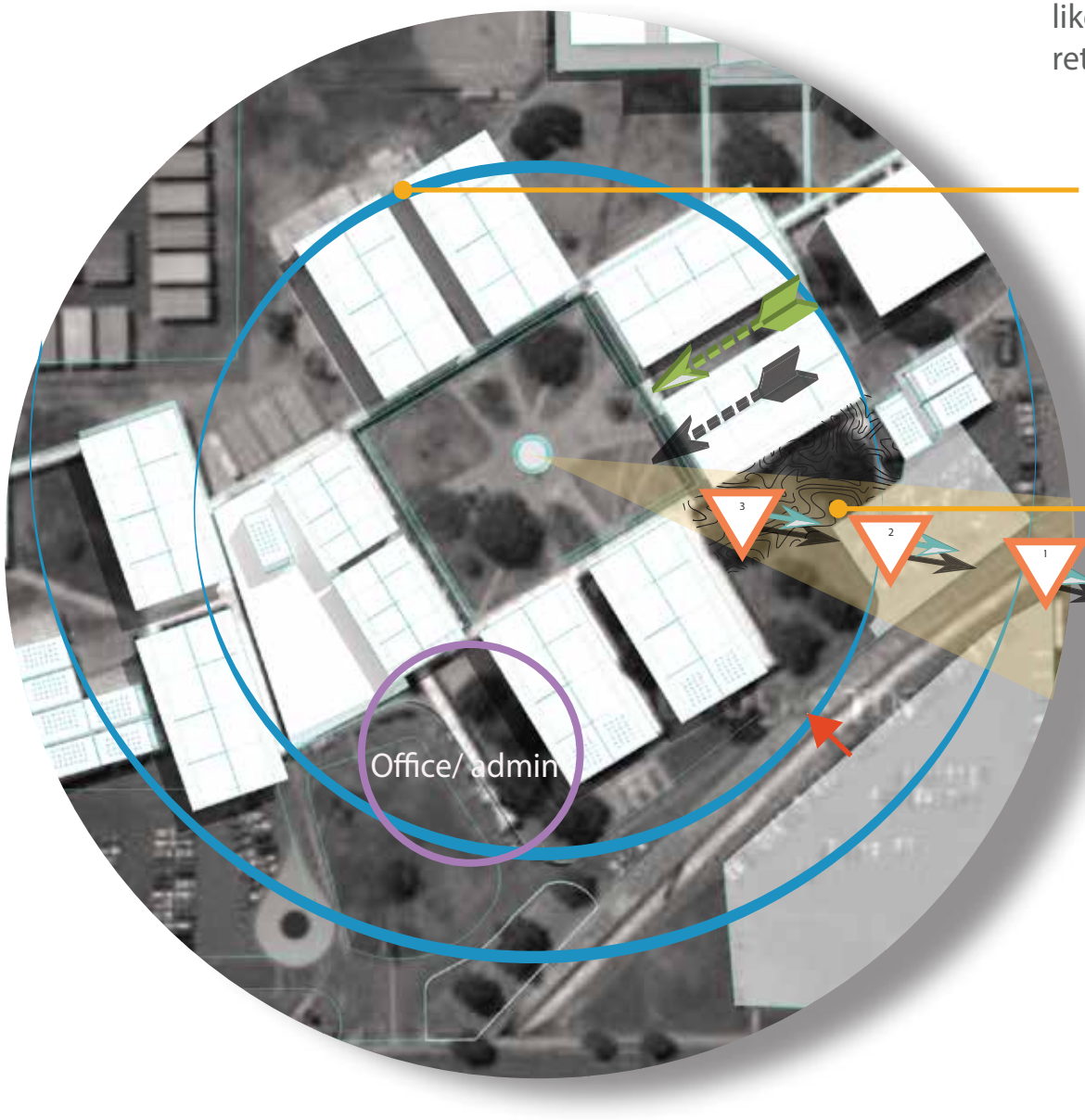
Site Context

Santiago High School, Garden Grove, CA



At a glance:

Santiago High School is nestled at the heart of Orange County in Southern California. Built for the challenges of the 1960's, my Alma Mater like other schools nationwide are in need of retrofitting in order to reduce vulnerability.

Vulnerability:

Studies have found that the campus plan of the 1960's is the most vulnerable to external attacks. The widespread campus buildings reduces natural surveillance and creates unsecured areas where external threats can enter from.

Layers of Defense:

Wise planning and design allows for three layers of defense. Each layer provides a buffer zone that acts as defensible space. Space can be broken down into the following:
Layer 1: Perimeter to street
Layer 2: Building Yard to perimeter
Layer 3: School building
The objectives of layers of defense are to increase natural surveillance from inhabited buildings.

Stand-Off Distances:

Minimum stand-off distance between non-load bearing wall and controlled vehicle access area is 20' maximum. Distance based on weight of explosive, wall material and buffer.

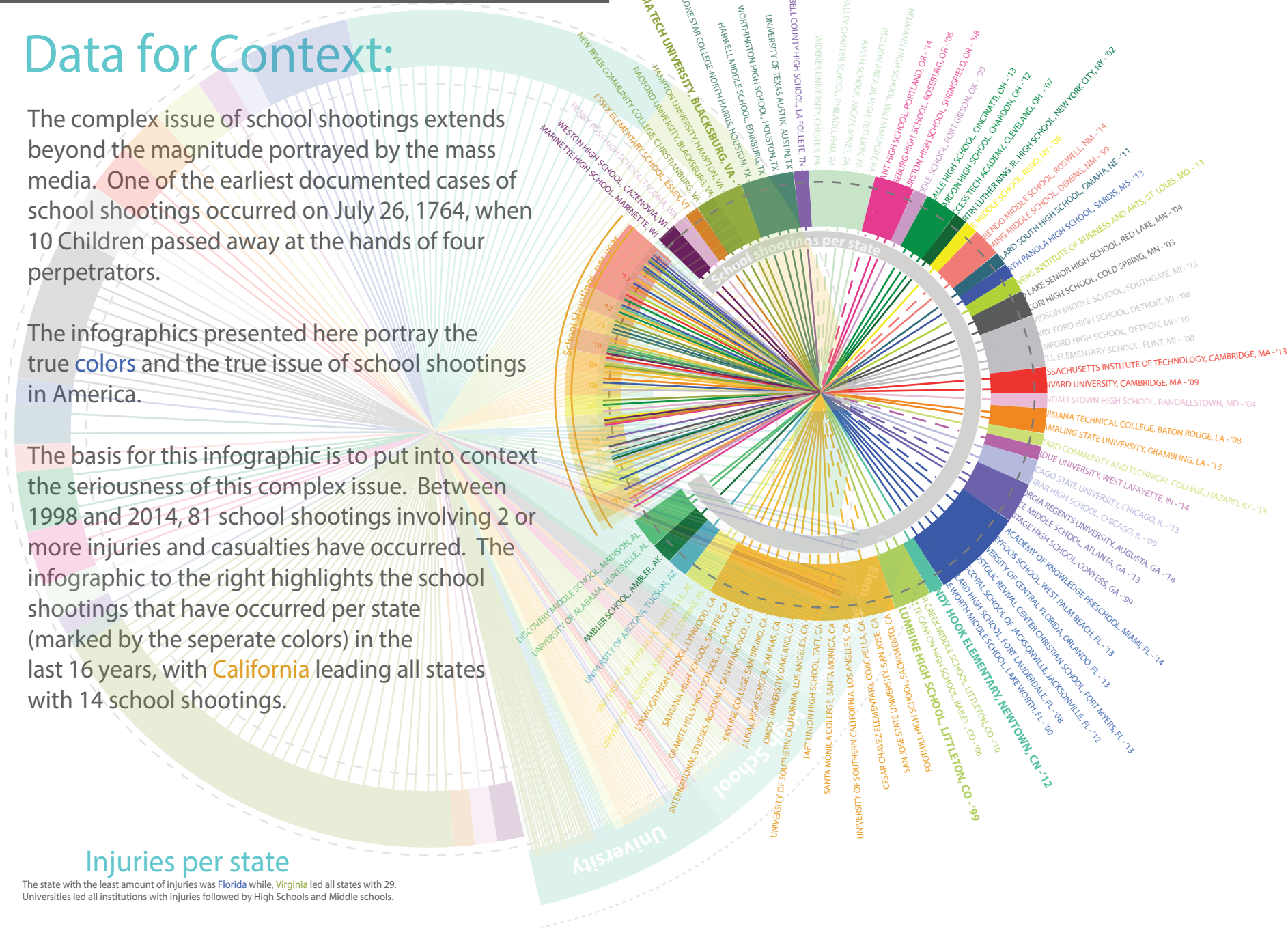
Data Visualization

Data for Context:

The complex issue of school shootings extends beyond the magnitude portrayed by the mass media. One of the earliest documented cases of school shootings occurred on July 26, 1764, when 10 Children passed away at the hands of four perpetrators.

The infographics presented here portray the true colors and the true issue of school shootings in America.

The basis for this infographic is to put into context the seriousness of this complex issue. Between 1998 and 2014, 81 school shootings involving 2 or more injuries and casualties have occurred. The infographic to the right highlights the school shootings that have occurred per state (marked by the seperate colors) in the last 16 years, with California leading all states with 14 school shootings.

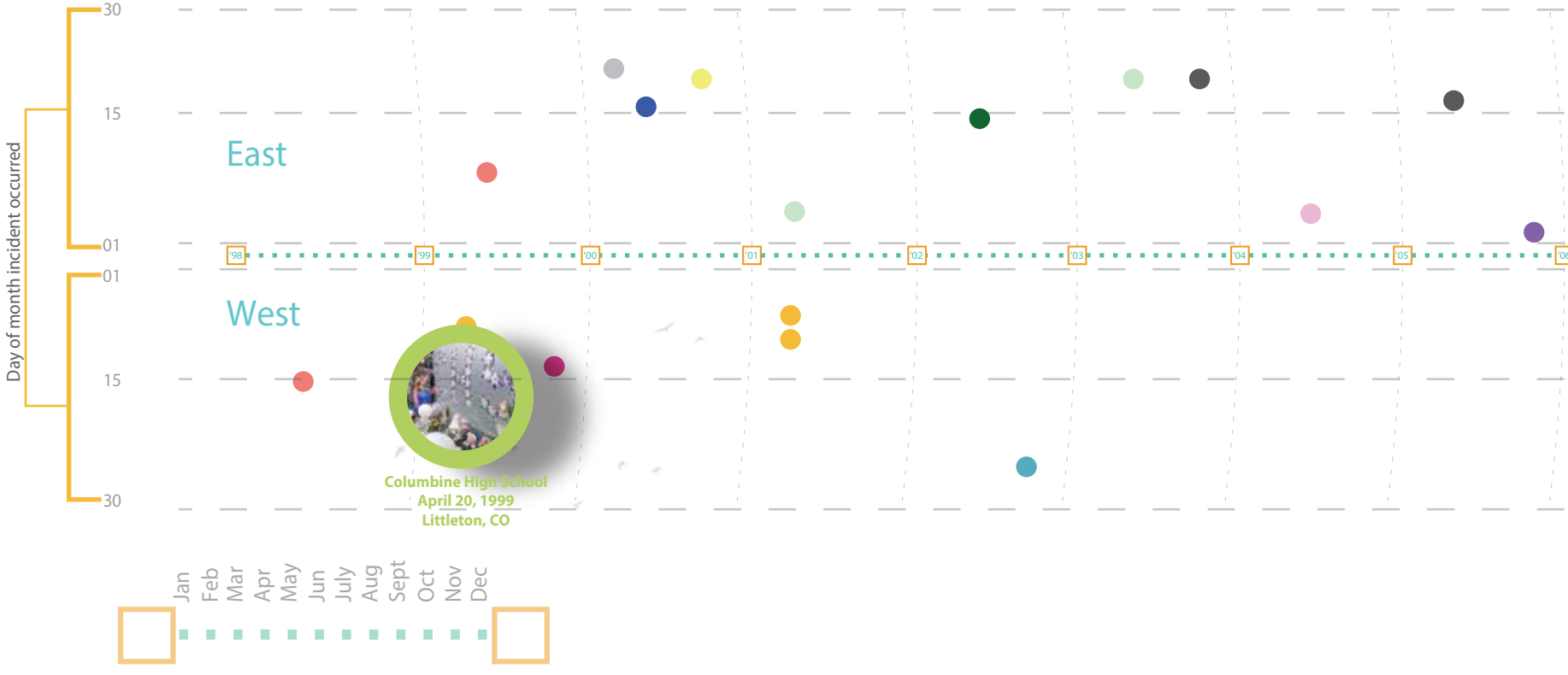


Injuries per state

The state with the least amount of injuries was Florida while, Virginia led all states with 29. Universities led all institutions with injuries followed by High Schools and Middle schools.

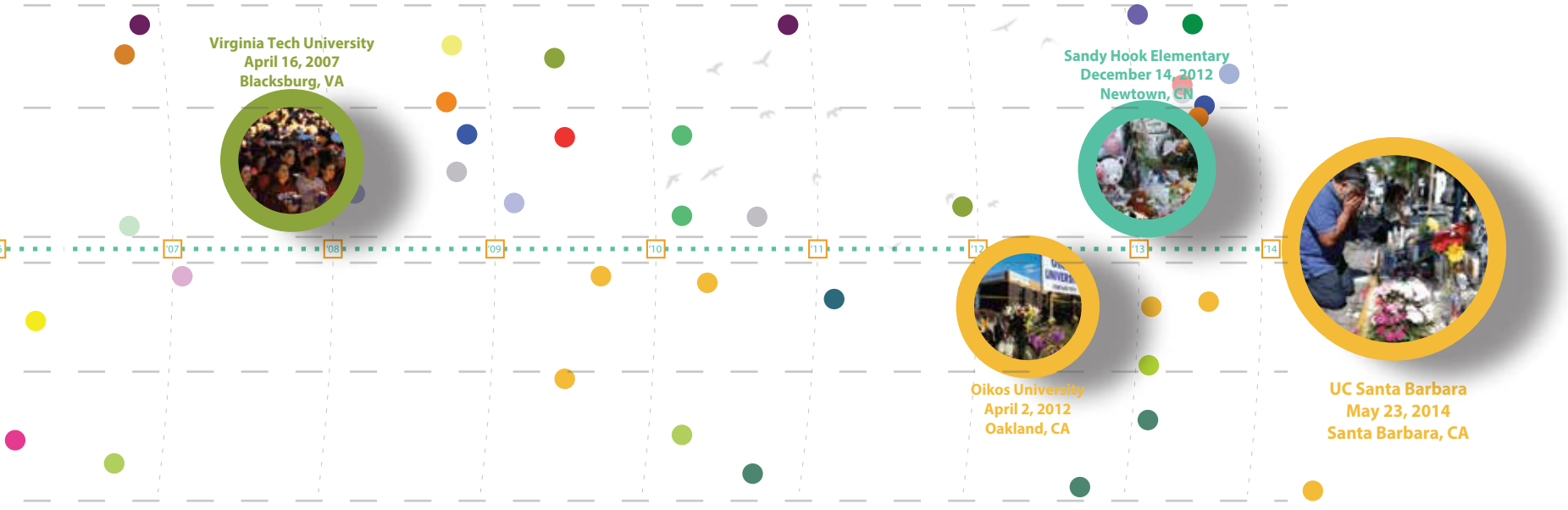
Data Visualization

Timeline: The true colors of school shootings, 1999-2014



Every colored dot correlates to a school shooting in that particular state. The infographic in the previous page can be used as a referrence. The color Orange represents California.

In a recent study performed by the Center for Disease Control and Prevention (CDC), between 1999 and 2007, an increase of 107% in homicides and suicides occurred in schools for youth between the ages of 5-18.

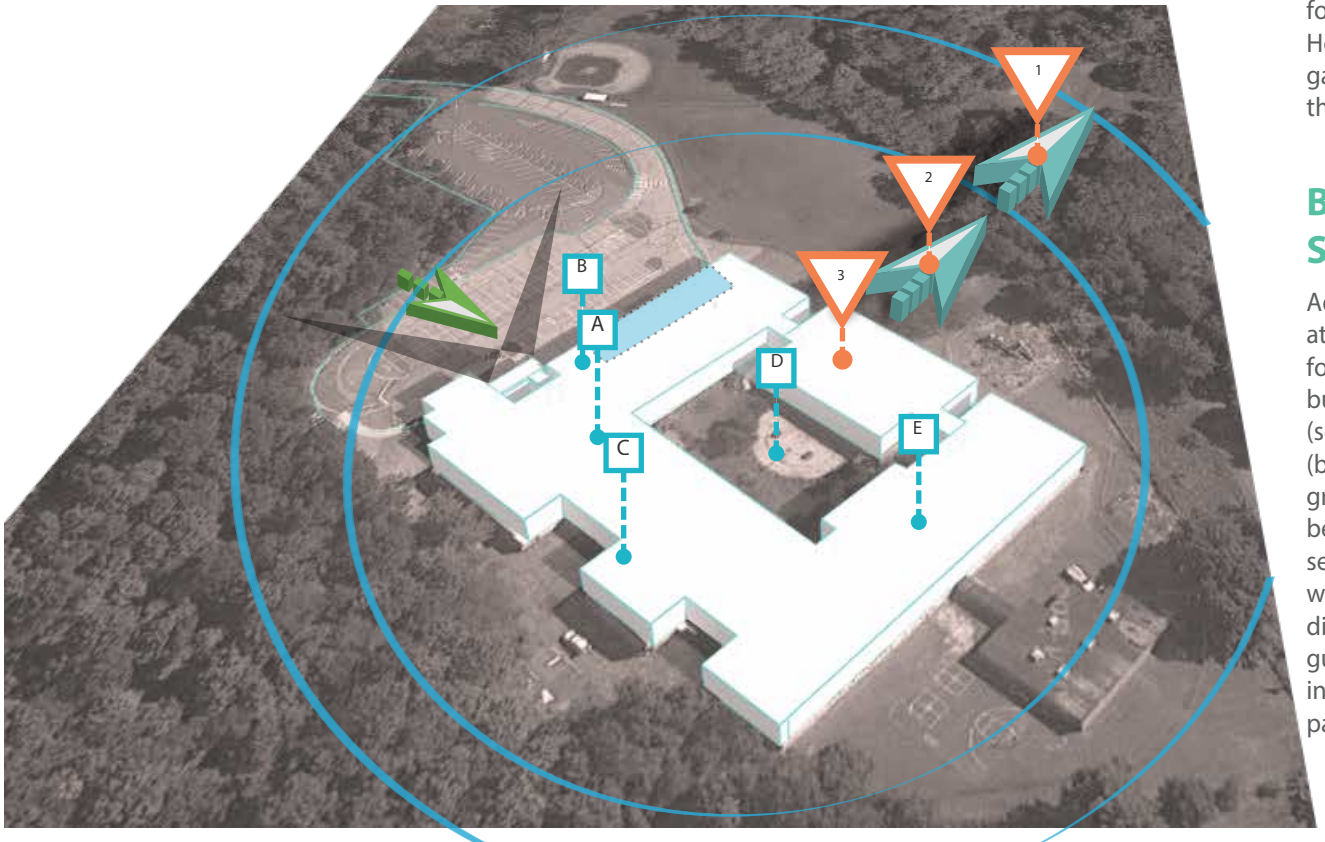


In 2013, 13 school shootings involving 2 or more casualties/injuries occurred marking the most school shootings in U.S. history.

As of June 6, 2014 6 school shootings involving 2 or more casualties/injuries have occurred with an additional 22 schools reporting 1 casualty/injury. 2014 is on pace to becoming the most tragic year in terms of school violence.

Case Study: Sandy Hook Elementary

Newtown, Connecticut
December 14, 2012



A Main Entrance
B Office/ Administration
C Cafeteria
D Courtyard
E Media Center

1 First layer of defense/ Perimeter to street
2 Second layer of defense/ Building Yard
3 Third layer of defense/ School Building

Buffer Zone
Attack area
Forced Entry/ Vulnerability
Viewsheds from Office

In Brief: Sandy Hook Elementary

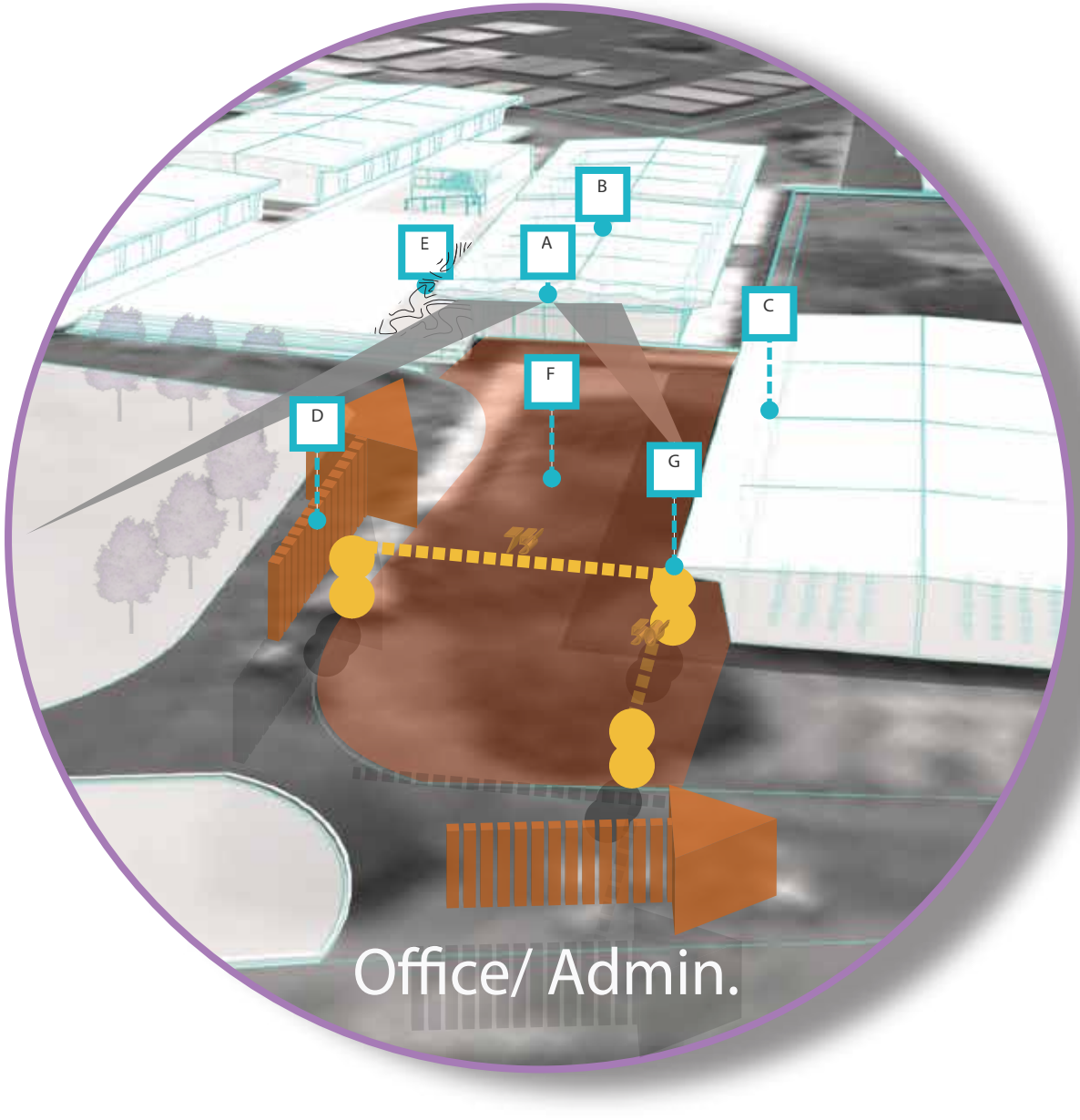
On December 14, 2012, 20 year old Adam Lanza forced his way through the front entrance at Sandy Hook Elementary after using a ballistic weapon to gain access. Lanza, then went on to commit one of the deadliest school shootings in American history.

Breaking down: Sandy Hook Elementary

Adam Lanza entered through the front entrance at Sandy Hook Elementary with little to no time for staff and students to react. A lack thereof in buffer space between the third layer of defense (school building) and the second layer of defense (building yard) established easy access onto school grounds. Without an increased stand-off distance between the inhabited building and parking lot, security was unable to see armed perpetrator walking towards the school. Minimum stand-off distances per Department of Defense (DoD) guidelines suggest 20'-50' buffer space between inhabited non-load bearing school buildings and parking lots.

Site Constraints:

Santiago High School, Garden Grove, CA



Viewsheds:

A Obstructed viewshed to student parking lot from administration office reduces natural surveillance and campus security.

B Viewsheds from inhabited buildings to campus perimeter, student parking lots and access points should be unobstructed.

Target Hardening:

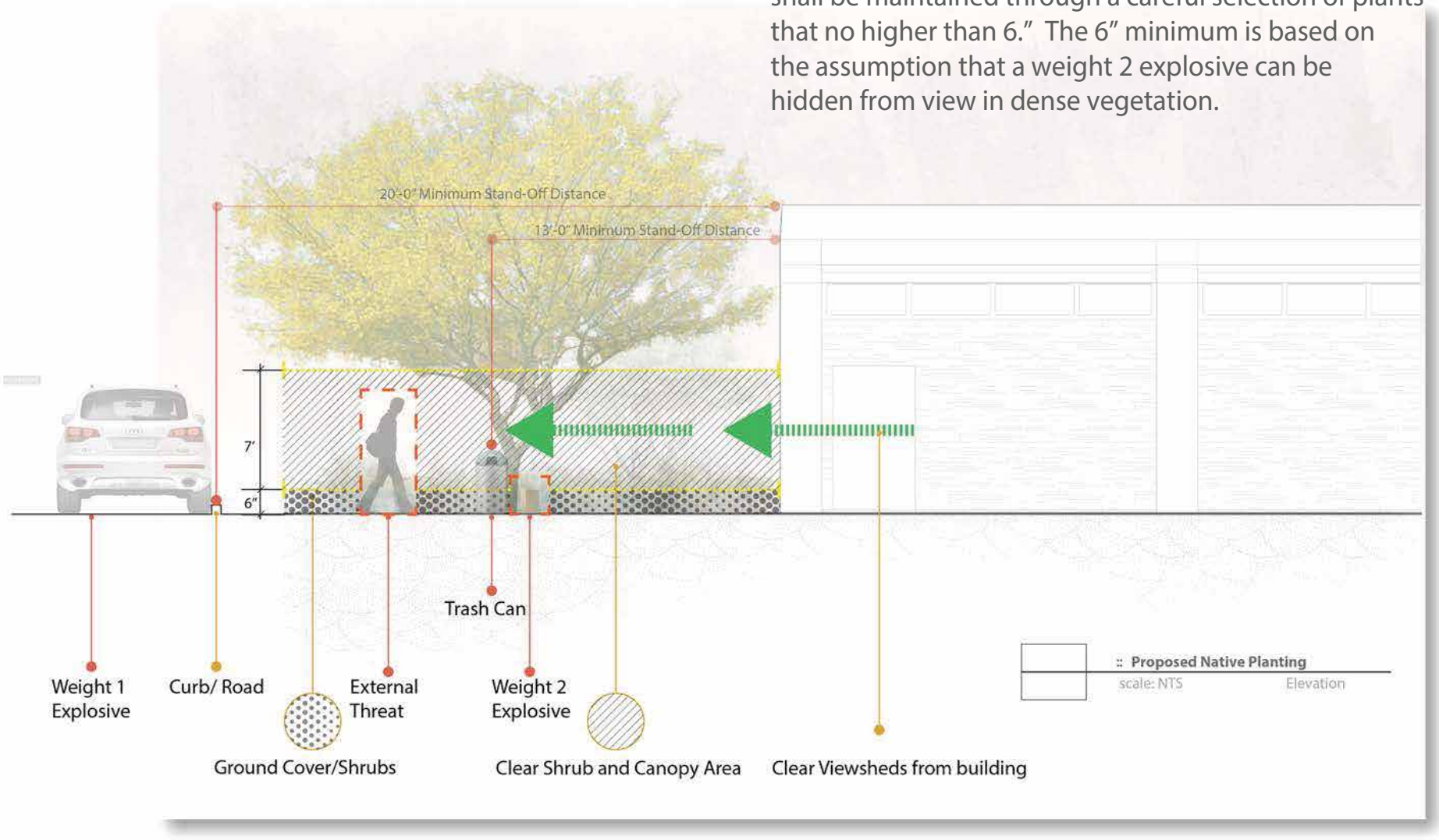
C Inhabited buildings are required to become hardened through external materials that reduce the ballistic and explosive effects of external threats. Re-enforced concrete, poured in place wall structures with little glazing offers the best protection for inhabitants.

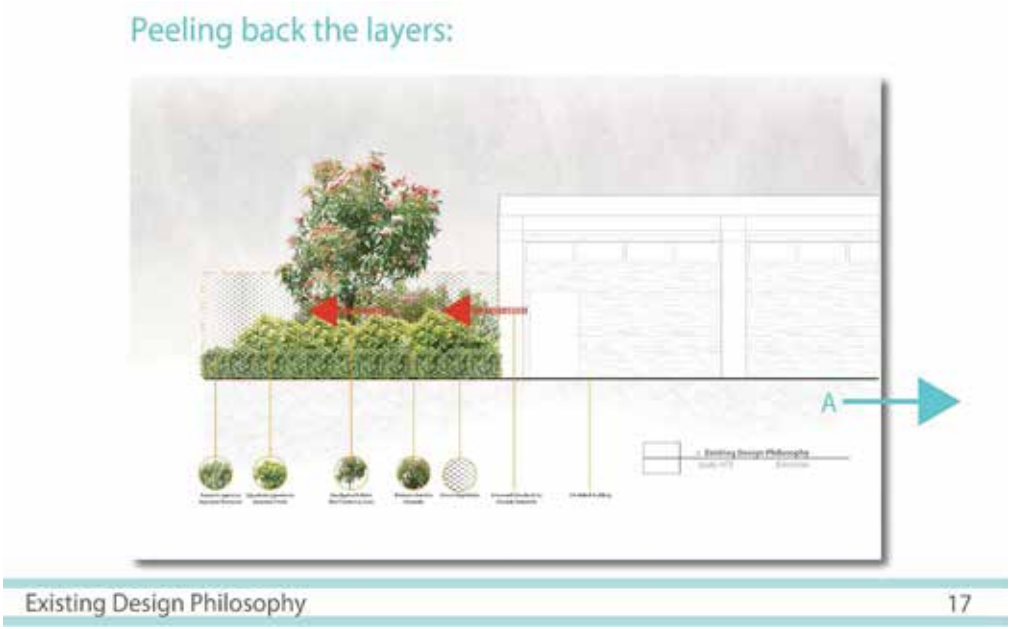
D Inhabited buildings should not have a road where a vehicle can potentially drive into. Target hardening reduces the risk by placing bollards, cheek walls, engineered planters and trees to protect buildings from potential weight 1, TNT caliber explosives.

Recommendations:

Deparment of Defense

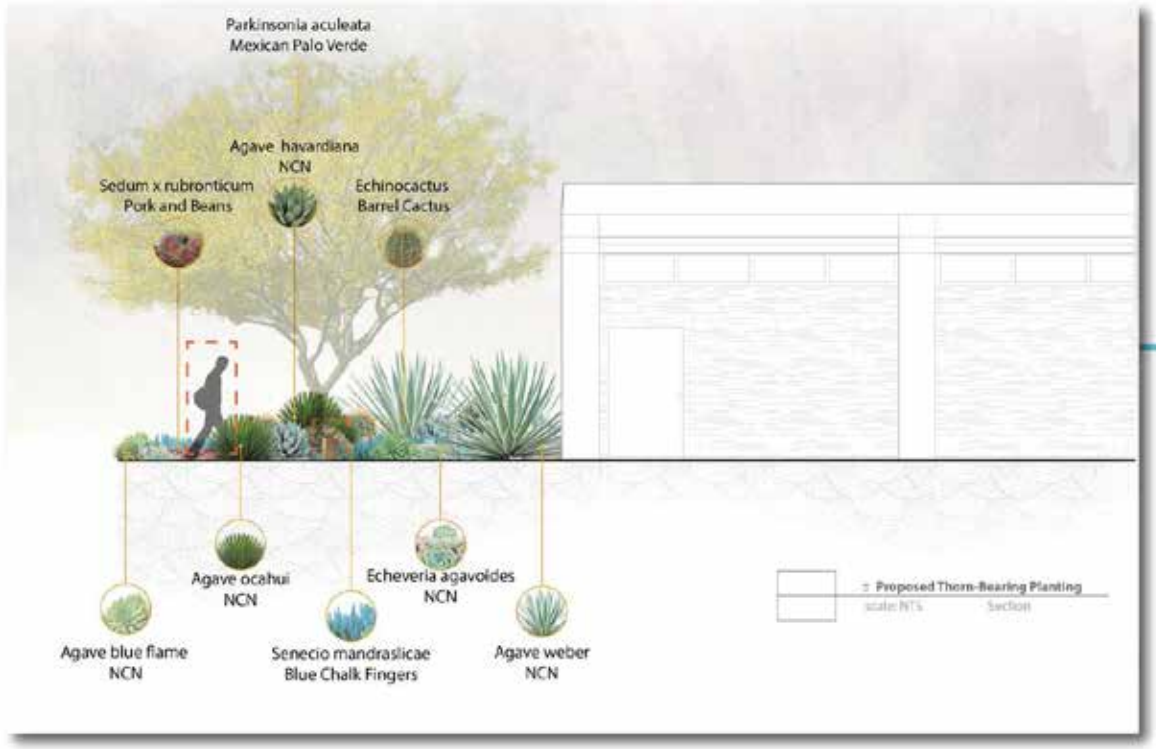
Per Department of Defense (DOD) recommendations, clear unobstructed viewsheds from inhabited buildings shall be maintained through a careful selection of plants that no higher than 6." The 6" minimum is based on the assumption that a weight 2 explosive can be hidden from view in dense vegetation.





Existing Design Paradigm

The current planting design paradigm, present in many schools were developed to keep cool and warm the internal environmental factors of a building. This design paradigm, however, promotes unobstructed views from inhabited buildings onto periphery. DOD standards suggest, a less obtrusive plant palette that increases views, thus providing inhabitants with valuable time to possibly see an intruder.



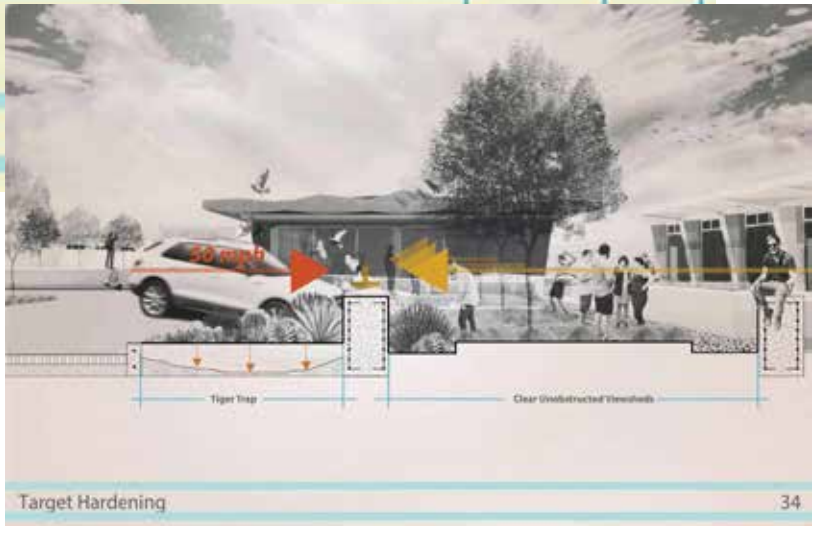
Proposed Design

The proposed planting pallette, increases views from inhabited buildings through a selection of plants that are low growing. The plants presented in the diagram to the left, were carefully selected due to their thorn-bearing qualities. This in turn, reduces the chance that an intruder will hide within. In addition, most plants presented are also below 6" fire retardant, low maintenance and drought tolerant.

Proposed Landscape Philosophy

Proposed Design

The proposed spatial arrangement at the front of Santiago High School is centered around layers of defensibe space, thorn-bearing plant palletes, unobstructed viewsheds to the periphery, bollardized seat walls (tiger trap) and fire retardant specimens to increase security.



Target Hardening 34

Topography

Proposed Design

The use of topography can play a tricky role in the design of safer schools. Topography should screen students on the inside of schools, protecting them from external threats. However, the use of topography renders the capability for an external threat to hide behind. It is therefore recommended that screened areas are within viewsheds.