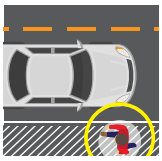
TECHNICAL BRIEF | Synthesis of Practices to Deter Pedestrians from Crossing Freeways

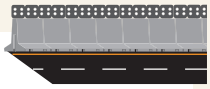
The Texas Department of Transportation (TxDOT) has seen an increase in recent years in crashes involving pedestrians crossing freeways and other high-speed roadways. This technical brief summarizes relevant practices found through a literature review, which included a variety of research studies, practitioner interviews and surveys, and published resources and guidelines. The review produced a set of countermeasures that could be assigned to several broad categories (see Table 1).

Table 1. Countermeasures for Freeways Identified from Literature Review.

A Accommodations

- **Overpass or underpass.**
- **Pedestrian facilities** on existing overpass or underpass.
- **Interchange redesign.**
- **Sidewalk or shared use path** on frontage roads.
- **Wider shoulder design** to allow more space for unintended pedestrians to walk along the side of the roadway after a breakdown or collision.





B Barriers

- **Pedestrian fencing** along right-of-way.
- **Pedestrian barriers** along right-of-way.
- **Median barrier** with optional attachments.

LA Laws

- **Fines** for pedestrians entering freeways.
- **"Move over" laws.**
- **Collision clearance laws.**

SE Services

- **Increase police surveillance** for motorist assistance.
- **Roadside assistance** program.
- **Circulator bus service** for local pedestrians.
- **Maps or electronic displays** for local pedestrians.

SP Signs (Pedestrians)

- **Pedestrian warning and regulatory signs** (perhaps in larger sizes).
- **Pedestrian wayfinding signs.**
- **No Pedestrian Crossing symbol signs** (R9-3) and No Pedestrian Crossing symbols stenciled on median barriers.

E Education

- **Pedestrian safety education** (e.g., risks inherent in crossing freeways, alternatives to crossing freeways).

- **Driver safety education** (e.g., best practices for car breakdown, awareness of possible pedestrian presence).

SD Signs (Drivers)

- **Warning signs** to alert drivers of possible pedestrian crossings (text and/or graphics).

LI Lighting

- **Freeway lighting.**
- **Overpass and underpass lighting.**
- **Adaptive lighting.**

O Other

- **Technology for monitoring pedestrian activities** and responses to help prioritize future pedestrian improvements.
- **Monitoring plan** to log police department dispatches, crashes, video recordings of crossings, and feedback from stakeholders.

Table 2 contains a summary of the countermeasure studies revealed in the review, including where the study was conducted, what type of pedestrian is addressed by the countermeasure, and whether the reviewed source described the effectiveness of the countermeasure in a formal study. Unintended (U) pedestrians are typically drivers of vehicles that have been involved in a minor crash or breakdown who then get out of the vehicle. Bystanders may stop to render aid and exit their vehicle to do so. Once out of the vehicle, they are considered pedestrians. Intentional (I) pedestrians enter the highway on purpose, for reasons such as taking a shortcut to nearby destinations (*1*). Intentional pedestrians also include those who walk along a highway because there are no available pedestrian facilities adjacent to the highway and pedestrians who cross the highway because because there is a long distance between crossings.

Table 2. Summary of Countermeasure Studies for Pedestrians on Freeways.

Cat	Countermeasure	Where	Ped Type	Effectiveness	Study?	Source
A	Provide overpass/underpass	Nationwide	I	Varies	Anecdotal	Hudson (*1*) Harkey (*3*)
A	Provide overpass/underpass	Nationwide	I, U	Crash reduction factor of 65–100 percent for pedestrian crashes	Yes	Gan (*8*)
A	Widen shoulder	Nationwide	I, U	Unknown	No	Hudson (*1*)
A	Widen shoulder	Arizona	I, U	Crash reduction factor of 71 percent for pedestrian crashes	Yes	Gan (*8*)
A	Redesign interchange, including addition of sidewalks and improved access to bus stops on city street	Englewood, Ohio	I	More welcoming environment, positive comments	Anecdotal	PEDSAFE (*2*)
A	Sidewalks or shared-use paths on frontage roads	Austin	I, U	Unknown	No	Allred (*4*)
A	Install sidewalk	Nationwide	I, U	Crash reduction factor of 65–89 percent for pedestrian crashes	Yes	Gan (*8*)
A	Accommodations on over/underpasses	Texas	I	Unknown	Yes	Gan (*8*)
B	Pedestrian fencing or barriers at right-of-way	Nationwide	I	Unknown	No	Hudson (*1*) Harkey (*3*)
B	Barrier plan for specific corridor	Austin	I	Unknown	No	Allred (*4*)
B	Median barrier	Texas	I	Unknown	No	Finley (*5*)
LA	Fines for pedestrians entering controlled-access roadways	Nationwide	I	Fines can create a disincentive to pedestrians who may otherwise enter the freeway	No	Hudson (*1*)
LA	"Move over" and collision clearance laws	Nationwide	I, U	Unknown	No	Hudson (*1*)
SE	Roadside assistance program	Nationwide	U	Unknown	No	Hudson *(1)*
SE	Increase police surveillance	Nationwide	I, U	Varies	Anecdotal	Harkey (*3*)
SE	Provide maps or electronic displays for navigation	Austin	I	Unknown	No	Allred (*4*)
SE	Circulator bus service	Austin	I	Unknown	No	Allred (*4*)
SE	Roadside assistance program	Texas	U	Unknown	No	Finley (*5*)

Table 2. Summary of Countermeasure Studies for Pedestrians on Freeways (continued.)

Cat	Countermeasure	Where	Ped Type	Effectiveness	Study?	Source
SP	Large, visible pedestrian warning signs	Nationwide	I	Varies	Anecdotal	Harkey (*3*)
SP	Pedestrian wayfinding signs	Austin	I	Unknown	No	Allred (*4*)
SP	Pedestrian warning and regulatory signs	Austin	I	Unknown	No	Allred (*4*)
SP	No Pedestrian Crossing symbol signs (R9-3) and No Pedestrian Crossing symbols stenciled on concrete median barrier	Austin	I	Unknown	No	Finley (*5*)
E	Driver safety education	Nationwide	U	Unknown	No	Harkey (*3*)
E	Pedestrian safety education	San Diego, California	I	Language and timing of educational messages need to target the vulnerable population of interest	Yes	Emry (*6*)
SD	Warning signs with graphics	San Diego, California	I	Signs with graphics were more effective than text signs	Yes	Emry (*6*)
SD	Warning signs to alert drivers of possible pedestrian crossings	Nationwide	I	Varies	Anecdotal	Johnson (*10*)
LI	Freeway lighting	Nationwide	U	Unknown	No	Hudson (*1*)
LI	Freeway lighting	Nationwide	I, U	Unknown	No	Harkey (*3*)
LI	Aesthetic lighting on overpasses to help illuminate the nearest safe crossing location	Austin	I	Unknown	No	Allred (*4*)
LI	Freeway lighting	Texas	I	Unknown	No	Finley (*5*)
LI	Freeway lighting	Florida	I	Crash reduction factor of 25 percent for roadway segment crashes	Yes	Hunter (*7*) Gan (*8*)
LI	Adaptive lighting system	Theoretical	I, U	Unknown	No	Wanvik (*9*)
O	Technology for monitoring pedestrian activities and responses to help prioritize future pedestrian improvements	Austin	I	Unknown	No	Allred (*4*)
O	Establish a monitoring plan	Austin	I	Unknown	No	Allred (*4*)

COLUMN HEADINGS:

- **Cat.** Countermeasure category, where A = Accommodations, B = Barriers, LA = Laws, SE = Services, SP = Signs (Pedestrians), E = Education, SD = Signs (Drivers), LI = Lighting, and O = Other.
- **Countermeasure.** Description of the countermeasure.
- **Where.** Examples of where the countermeasure has been considered.
- **Ped Type.** Type of pedestrian, where I = Intentional and U = Unintended.
- **Effectiveness.** Summary of effectiveness of the countermeasure as identified in the literature review.
- **Study.** Where Yes = formal study conducted, No = no study identified for this countermeasure, and Anecdotal = observations on the perceived effectiveness of the countermeasure.
- **Source.** References that discuss the countermeasure.

REFERENCES

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