Diagrams

These pages of diagrams include information on technological changes, vehicle engineering, current research information, and new and less well-known techniques and strategies. The engineering advancements that have taken place in recent years are described and shown with the rationale of why they are mentioned and taught. If you have questions, please feel free to ask your TSE teacher.

Air Bags and Seat Placement

With the advent of the air bag and its deployment at about 200 mph, it is imperative that the driver and passenger be at least 11 to 12 inches away from the steering wheel or dashboard.

Remember that your seat has adjustments for the seat movement and the back placement and many steering wheels come with a tilt option. For those who have difficulty in reaching the pedals, extensions are available for better foot placement and control.

Air Bags and Steering Wheels

With the development of the air bag, much has changed in how we think of safety in automobiles. This safety device must be approached with knowledge and respect.

Consider our hand placement on the steering wheel. "10 and 2" is no longer the standard operating procedure. Air bags deploy at around 200 mph. Anything in the way of the deploying bag will be propelled, injured, or broken. The air bag is used to soften the ride-down effect of the body before it comes to a stop. If hands and arms are covering the steering wheel at the time of deployment, the chances are you will be injured.

The alternative is to train yourself to grasp the steering wheel between "9 and 3" and "8 and 4," with the thumbs lightly resting on the face or side of the steering wheel.

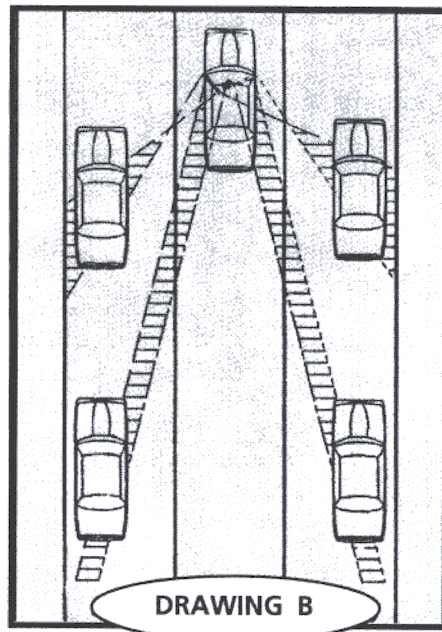# Outside Mirror Placement
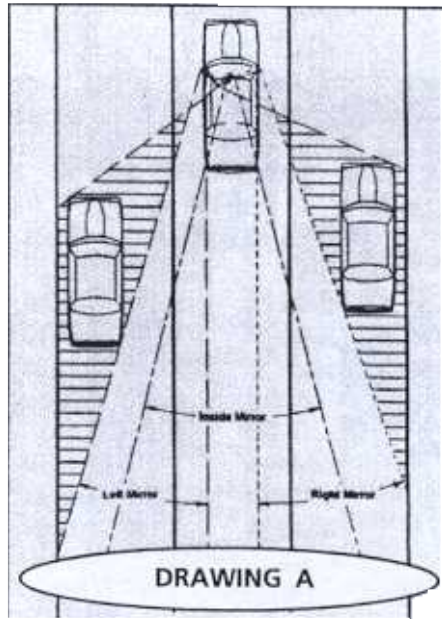
DRAWING A

Drawing A shows the field of vision of both the inside and outside mirrors. Notice that the blind zones to the left and right are able to conceal a vehicle which counts for the high number of lane change/merge crashes.
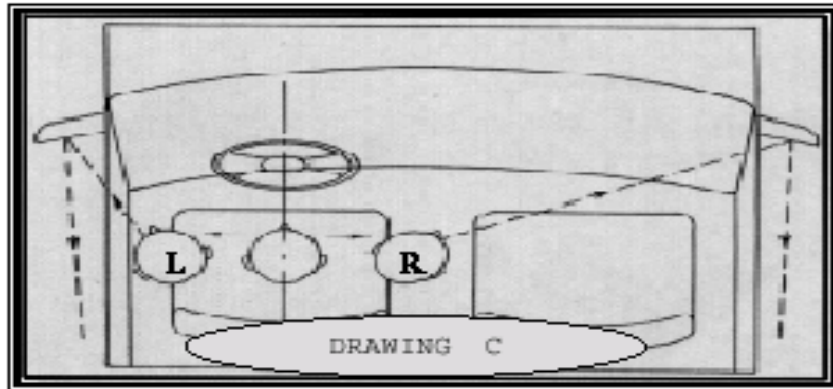
New "BGE" Mirror Placement

Drawing B shows the blind zones greatly reduced to the left and the right and provides the driver with an enhanced mirror view, thus nearly eliminating the blind spots.

This setting of the mirrors is called the "blind zone/ glare eliminating setting (BGE).

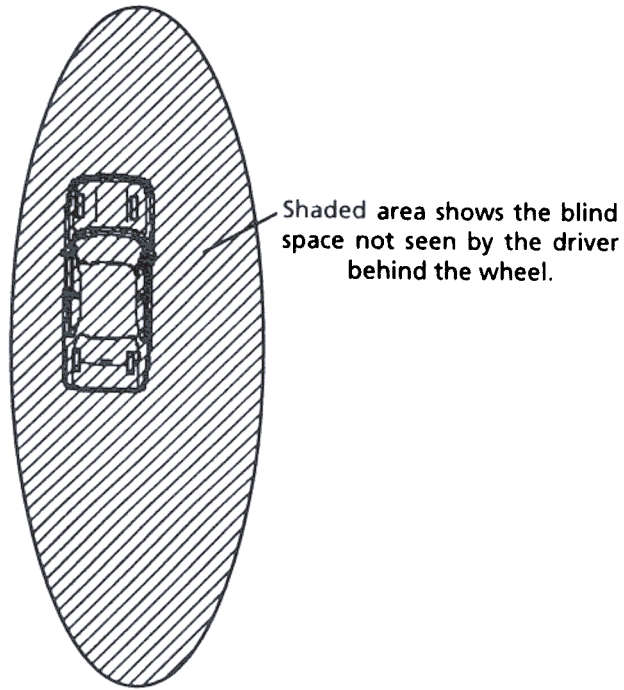**DRAWING B**

The New BGE Setting

DRAWING C

The new BGE setting requires you to widen your usual mirror placement about 15 degrees. This setting not only lessens your blind spot area and lets you see more with your mirrors, but also eliminates the night glare of the headlights of the vehicle following you.

To set the outside left mirror to the new BGE setting, simply place your head against the side window as seen in Drawing C. Then set the mirror to see the side of the car as you would normally see it. To set the outside right mirror, position your head in the middle of the car and adjust the right mirror as you normally would see it.
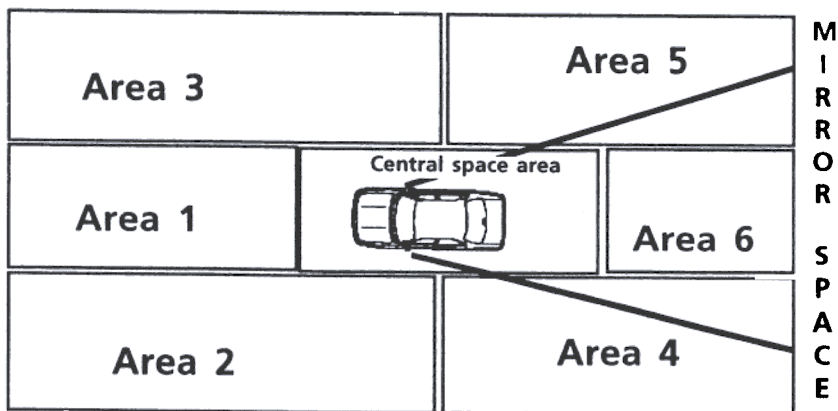
It will take time to overcome your previous habits and accept the new way, but it will happen. Perseverance will reward you with a new dimension in driving which will enhance your safety and comfort.

Adapted from *A Simple Way To Prevent Blind Zone Accidents,* George Platzer, consulting engineer and SAE member.

Vehicle Operating Space and the Car's "Footprint"
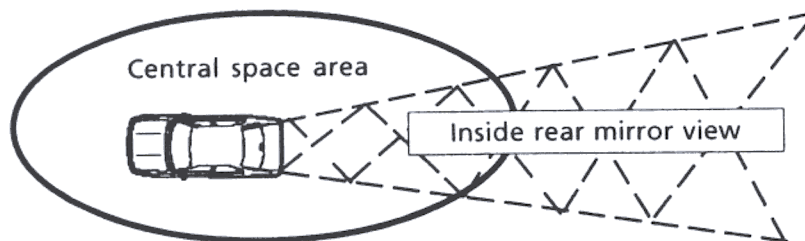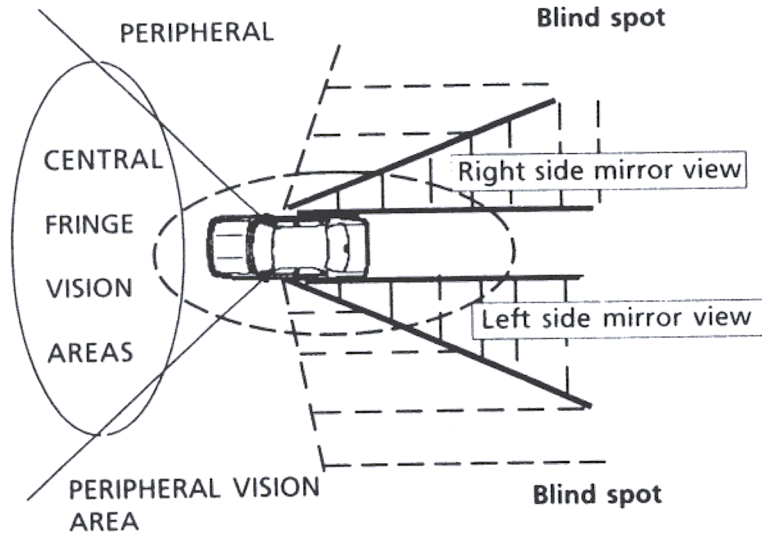
Shaded area shows the blind space not seen by the driver behind the wheel.

SPACE AREAS

Area 3		Area 5	M
	Central space area		I R R O R
Area 1		Area 6	
Area 2		Area 4	S P A C E

Vision and Scanning
Mirror spaces and blind spots
(traditional mirror setting)

PERIPHERAL

Blind spot

CENTRAL

FRINGE

VISION

AREAS

Right side mirror view

Left side mirror view

PERIPHERAL VISION AREA

Blind spot

Central space area

Inside rear mirror view

Vision and Scanning

TARGET
20-30 SECONDS
AHEAD

VISUAL LEAD TIME/DISTANCE
12-15 SECONDS AHEAD

SCANNING
SIDE TO SIDE AND
INTERSECTION
PROBLEMS

DETECTING
EARLY HAZARDS
AND MOVEMENT

What you can see
in your side mirrors.

What you cannot see in your mirrors.

Develop a search pattern incorporating the above areas!

You need a proper search pattern
to be able to properly WEA.

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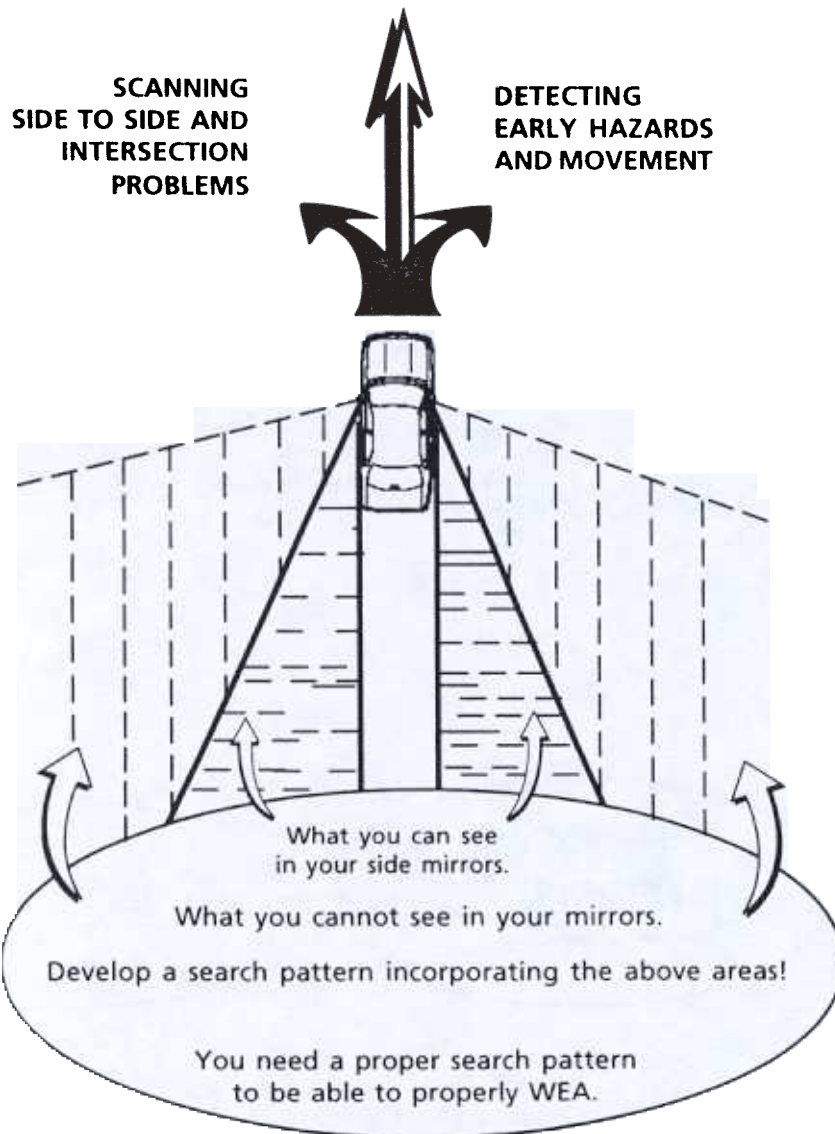
The WEA Way!

WEA

Space management system which includes the process steps of watch, evaluate, act (WEA).

Watch

Look for High-Risk Situations

- -Search and scan
- -Time to perceive hazards
- -Keep stable eye movement
- -Sight line and travel path (LOS/POT)
- -Get larger view of roadway

Gain Information

- -Space management
- -Look for changing areas
- -Look for open areas
- -Look for closed areas

Evaluate

Recognize High-Risk Situations

-Potential and critical hazards
-Collision potential
-Intersections
-Curvatures
-Speed

Decision Making

-Prevent high-risk situations
   •Sight line and travel path (LOS/POT)
   •Lane position
   •Time space
   •Space control

-Control high-risk situations
   •Open sight line and travel path
   •Motion control (controlled-threshold braking, progressive acceleration)

-Steering control
   •Hand over hand
   •Evasive action
   •Shuffle/slide hand

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Act

Speed Changes in Response

-To danger
-To traffic conditions
-To roadway conditions
-To vehicle balance

Lane Position Changes in Response

-To danger
-To traffic conditions
-To roadway conditions
-To vehicle balance

Space Control in Response

-To danger
-To traffic conditions
-To roadway conditions
-To vehicle balance

NOTES

NOTES

Reference Points

The "footprint" below shows us that we cannot see every spot around the vehicle. We need help to maneuver the vehicle within this "blind" area.

Maneuvers such as parking, stopping, backing, and lane position can be done more accurately and safely when using reference points. In the next few pages, diagrams and short descriptions will help you to identify these points of reference and provide rationale on where to use them.
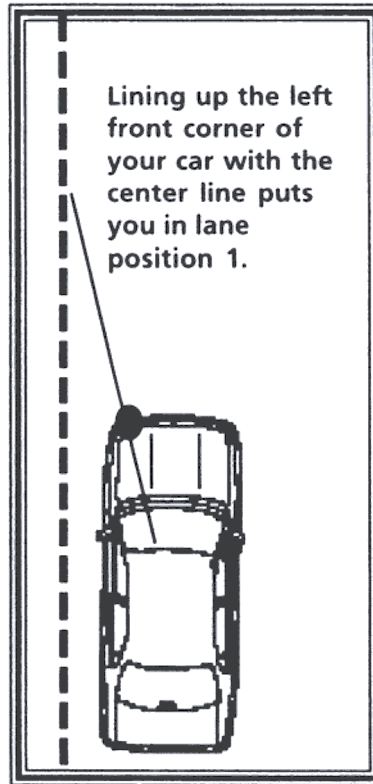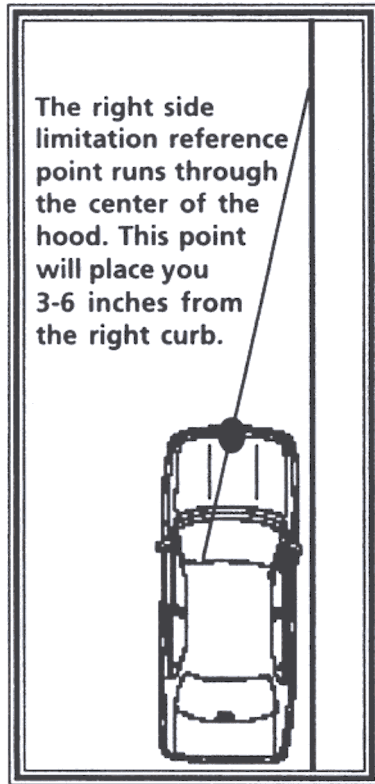
Reference points are points on the vehicle that assist the driver in determining when to start turning, vehicle limitations, or where the vehicle is actually located.
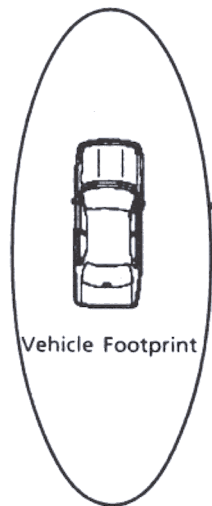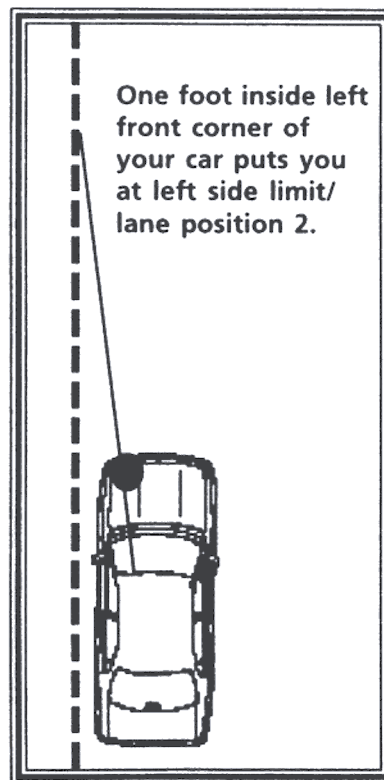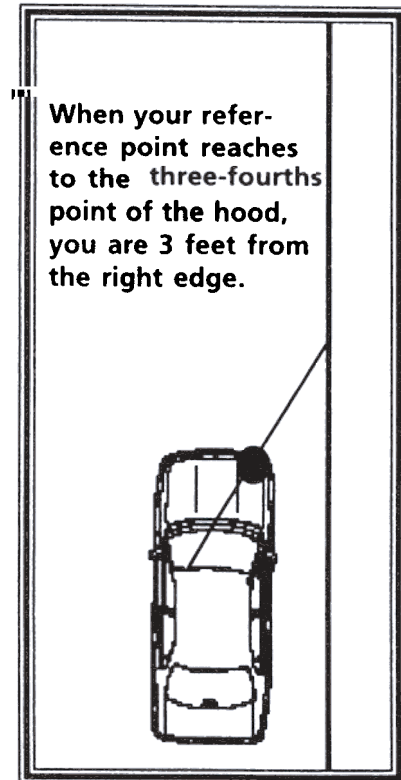
It is essential that the new driver recognize that there is a "footprint" space around the vehicle that one cannot see from behind the steering wheel. This "footprint" makes it almost impossible to maneuver the vehicle within this blind space with any assurance of accuracy. Unless one uses some sort of reference guide, the only option is trial and error. We propose using reference points when maneuvering within this area.

Vehicle Footprint

Reference Points

A guide to finding reference points on your vehicle.

The right side limitation reference point runs through the center of the hood. This point will place you 3-6 inches from the right curb.

Lining up the left front corner of your car with the center line puts you in lane position 1.

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Reference Points

Rear limitation.

Front limitation.
Stopped right turns
and left turns.

When your refer-
ence point reaches
to the three-fourths
point of the hood,
you are 3 feet from
the right edge.

One foot inside left
front corner of
your car puts you
at left side limit/
lane position 2.

Reference Points

Rear corner post or blind spot. This reference point is for backing turns (the reference point is over the rear tire).

Reference points can help to determine when it is time to turn in a backing maneuver. Once turned, reference points can also help the driver determine vehicle position on the side street.

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Lane Positions