

Unit 2: The Driving Task and Environment In Car Resources

<u>Session 5 BTW: Driving Maneuvers</u>	1
<u>Session 6 BTW: Driving in Different Environments</u>	9
<u>Session 7 BTW: Sharing the Road</u>	15
<u>Session 8 BTW: The Physics of Driving and Occupant Restraint</u>	22
<u>Unit 2 BTW Checklist</u>	27

SESSION 5 BTW – DRIVING MANEUVERS

Topics Addressed:

- Driving maneuvers that help us make tight turnarounds
- The procedure for changing lanes safely
- How signs, signals, and markings direct traffic and affect drivers in the highway transportation system (HTS)

Description of Suggested Driving Route:

Intermediate traffic risk environment, such as an urban, residential, or business area

Supporting Topics for Discussion:

- Steering Technique - hand over hand /push and pull
- Changing lanes
- SMOG (Signal, Mirror, Over the Shoulder, Go)
- Pulling away from curb
- Lateral moves
- Right hand turns
- Left hand turns
- Right-of-way at intersections
- Lane positioning
- Lane Usage
- Passing maneuvers
- Backing left and right
- Turnabout U-turn
- 2-point turnabout
- 3-point turnabout
- K-turn or 3-point turn
- Parallel parking
- Angle parking
- Perpendicular parking
- Uphill/downhill parking

- Reference parking points

Fundamental Driving Skills:

- Procedures for traffic maneuvers needed in various traffic situations, such as:
 - Lane changing
 - Intersections
 - Right-of-way
 - Rules of the road
 - Lane usage
 - 2-point and 3-point turns (turnabouts)
- Continue working on driving skills and situations in various driving environments/routes

Supporting Learning Activities:

- ***Activities for the Student Driver While Behind the Wheel:***
 - [Instructor's Checklist for Driver's Performance](#)
- ***Activities for the Student Observers:***
 - [Instructor's Checklist for Observer's Participation](#)
 - [Activity 5.1](#)
 - [Activity 5.2](#)
 - [Activity 5.3](#)

Supporting Activities for Parents/Guardians to Complete with Their Student Driver:

- Associated Sections of Children's Hospital of Philadelphia "*TeenDrivingPlan*" Practice Guide
- Associated National Safety Council "*DriveitHome*" Pointers for Parents

Assessment Tools:

- On-going Evaluation Sheet
- Student Card Rating Score 5-4-3-2-1
- Skill/Observation Scores
- Ask observers to watch for 2 skill strengths and 2 skill weaknesses that each driver might improve

SESSION 5 BTW SKILLS AND ACTIVITIES – DRIVING MANEUVERS

<i>Instructor's Checklist of the Driver's Performance- check off the characteristics reviewed and demonstrated on various routes.</i>	
	Driver executes proper stop sign procedure: stop line, staggered stop line, crosswalks, and stop signs only
	Lists potential hazards approaching intersections containing: fresh OR stale green lights, yellow lights OR “point of no return” situations
	Navigates and explains rules and dangers associated in school zones, recreational park, and construction zones
	Properly navigates driving situations related to: right of way, yielding right of way, limited visibility, limited space and/or limited traction during various driving conditions
	Driver executes proper: timing maneuvers, minimizing skills, separating skills, and compromising skills when driving on/in rural roads, rural highways, business districts, shopping malls, and shared left or right turn lanes
	Explain and demonstrate proper “off-road recovery skills” in various driving environments

<i>Instructor's Checklist for Observer's Participation - discuss and review the following topics with the observers in the vehicle.</i>	
	Using a hand-held white board, diagram the positions of each of the six zones of zone control driving
	Tally the number of times that a driver spikes the brakes for abrupt stopping and reflect on the possible outcome of those situations

	Discuss how knowledge and experience helps a driver make accurate predictions about other drivers' actions
	Evaluate the lane position that the driver maintains in various traffic situations
	Complete Activity 5.1
	Complete Activity 5.2
	Complete Activity 5.3

Activity 5.1

Instructions: While in the driver education vehicle as an in-vehicle observer, evaluate the driver performance on the below basic skills.

Pre-driving checks and adjustments

Yielding the right of way

Starting, moving and stopping smoothly

Backing up

Making accurate left turns

Making accurate right turns

Following safely behind other vehicles

Identifying signs appropriately

Activity 5.2

Instructions: While in the driver education vehicle as an in-vehicle observer, evaluate the driver performance on the below intermediate skills.

Turning around by pulling into an alley or driveway

Changing lanes (light traffic)

Maneuvering through simple intersections

Communicating with other drivers

Adjusting speed and position for traffic

Three-point turns (K-turn)

Perpendicular parking (school)

Passing on two lane highways

Activity 5.3

Instructions: While in the driver education vehicle as an in-vehicle observer, evaluate the driver performance on the below advanced skills.

Maneuvering through busy intersections

Recognizing dangerous conditions

Parallel parking

Changing lanes in heavy traffic

Passing on a multi -lane highway

Passing on two-way highways

Driving in rain, snow, fog, poor lighting conditions

SESSION 6 BTW – DRIVING IN DIFFERENT ENVIRONMENTS

Topics Addressed:

- How driving environments differ
- How driving skills are modified to adjust to driving environments and when conditions change
- How to apply the SEE/SIPDE approach to different driving environments

Description of Suggested Driving Route:

- Intermediate traffic risk environment, such as an urban, residential, business area, and higher risk interstate and/or highway routes
- Routes developed for Sessions 6-10 should review and build on the driving skills and maneuvers learned in Sessions 2-5

Supporting Topics for Discussion:

- Basic speed laws
- Characteristics of residential, business, rural, interstate, city, school, shopping centers
- Limited visibility, space, and traction situations
- Techniques: isolate, separate, compromise, minimize hazards
- Intersection maneuvers: 2-way stops, 3-way stops, 4-way stops, yielding right-of-way, proper lane usage, and a variety of traffic light controls

Fundamental Driving Skills:

- Continue working on driving skills and situations in various driving environments/routes
- Applying visual/scanning rules/SIPDE
- Following distance/space rules, zone control
- Speed adjustments
- Understanding separate and compromising risks/concepts in the following environments:
 - Residential

- Urban
- Rural
- Business district
- Interstate

Supporting Learning Activities:

- **Activities for the Student Driver while Behind the Wheel:**
 - [Instructor's Checklist for Driver's Performance](#)
- **Activities for the Student Observers:**
 - [Instructor's Checklist for Observer's Participation](#)
 - [Activity 6.1](#)
 - [Activity 6.2](#)

Supporting Activities for Parents/Guardians to Complete with Their Student Driver:

- Associated Sections of Children's Hospital of Philadelphia "*TeenDrivingPlan*" Practice Guide
- Associated National Safety Council "*DriveitHome*" Pointers for Parents

Assessment Tools:

- On-going Evaluation Sheet
- Student Card Rating Score 5-4-3-2-1
- Skill/Observation Scores
- Ask observers to watch for 2 skill strengths and 2 skill weaknesses that each driver might improve

SESSION 6 BTW SKILLS AND ACTIVITIES - DRIVING IN DIFFERENT ENVIRONMENTS

<i>Instructor's Checklist of the Driver's Performance- check off the characteristics reviewed and demonstrated on various routes.</i>	
	Explain proper uses of: road numbering systems, mile markers, and amber alert system
	Explain similarities and differences of challenges presented by: expressways, interstates or tollways
	Demonstrate and explain safe and proper navigation of: cloverleaf, diamond, and trumpet interchanges
	Execute and explain proper use of cruise control
	Explain differences between posted speed and advisory speed
	Explain and demonstrate proper safety used on entrance and exit ramps
	Explain and demonstrate proper safety in acceleration and deceleration lanes
	Explain and demonstrate safe navigation of challenges presented at merge points, weave lanes, and ramps
	Explain and demonstrate safety considerations needed when: changing lanes, cruising, and entering/exiting roadways
	Safely execute and explain proper steps used when: changing lanes, overtaking vehicles or blending into lanes and passing
	Explain and execute proper safety when passing or not passing in: expressway, rural, residential, urban (city) or business environments
	Properly execute safety considerations when driving in: zebra lines, collector lanes, or protected lanes

	Identify components associated with: total stopping distance or stopping distance in various driving environments and conditions
	Identify 5 work zone hazard considerations needed while driving safely through these areas
	Execute safe and proper following distances in various weather conditions (4 second rule on the interstate, 2-3 seconds in perfect conditions & 12+ second rule on ice)

<i>Instructor's Checklist for Observer's Participation - discuss and review the following topics with the observers in the vehicle.</i>	
	Identify the restrictions to the path of travel in various driving environments and situations
	Identify restrictions to the line of sight in various driving environments and situations
	Review how to execute appropriate speed and position adjustments
	Recognize when separating techniques vs. compromising techniques should be used to minimize risks in traffic
	Complete Activity 6.1
	Complete Activity 6.2

Activity 6.1

Observers will take their knowledge of the highway transportation system out onto the roads in four separate driving sessions, which provide the opportunity to drive on residential, city, rural and expressway roadways.

In each session, the BTW instructor will reinforce how driving strategies are modified for each setting.

Residential

City

Rural

Expressway

The BTW instructor will evaluate how well observers were able to effectively describe driving strategies and potential modifications necessary in each setting.

Activity 6.2

Instructions: While observing in-vehicle discuss the following with your instructor.

- **Explain how to identify an intersection**
- **Describe the actions to take approaching an intersection**
- **Identify the way to correctly enter an intersection**
- **Define yielding right of way**
- **List situations in which the driver must yield right of way**
- **Predict how long it takes to cross and join traffic**
- **Count the time it takes as the driver begins an intersection maneuver**
- **Describe the correct procedure for entering an intersection controlled by signs**
- **Describe the correct action to take at traffic signals: green, yellow and red lights**
- **Explain the procedures for making unprotected and protected left turns**
- **Explain when it is legal and what the procedures are for turning right on red**
- **Explain when it is legal and what the procedures are for turning left on red**
- **Distinguish between passive and active railroad crossings**
- **Identify the correct action to be taken at railroad crossings**
- **Identify how roundabouts benefit drivers and pedestrians**
- **Compare the flow of traffic through a traffic circle to that of an intersection with a signal**
- **Explain the correct procedure for driving through a traffic circle**

SESSION 7 BTW – SHARING THE ROAD

Topics Addressed:

- Identify the many types of vehicles, cycles, pedestrians, animals, and other users who make use of and interface with the road
- Apply the SEE/SIPDE approach to aid in anticipating, preparing, and responding to crossings, shoulders, signs, signals, markings, and other road users

Description of Suggested Driving Route:

Begin in a low risk area, such as a parking lot and progress to more intermediate traffic risk environments - urban, business, residential, and rural/farm area

Supporting Topics for Discussion:

- **Sharing the roadway with other users**
 - Pedestrians
 - Mid-block crosswalks
 - Construction workers
 - Bicycles and mopeds
 - Large trucks and recreational vehicles (RVs) – “No-zones” (around trucks)
 - Off-tracking - rear wheels
 - Roll over hazards
 - Emergency vehicles
 - Move-over laws
 - Emergency vehicle procedures
 - Farm vehicles
 - Horse and buggy
- **Recognition action braking time/distance**
 - Stop line vs. crosswalk
 - Crossing, joining, leaving traffic
 - Railroad crossings
 - Surge
- **Traffic conflict situations**

1. Intersection vehicles and pedestrians
2. Oncoming vehicles
3. Entering and existing vehicle
4. Vehicles ahead of you
5. Vehicles behind you

- **Understanding parking regulations**
 - Handicap parking/special grocery store parking
 - No stopping, no parking, no standing
 - Emergency vehicle procedures
 - School zone
 - School bus zone

Fundamental Driving Skills:

Demonstration of:

- Pulling to and from the curb
- Parallel parking procedures
- Angle parking procedures
- Perpendicular parking procedures
- Uphill and downhill parking procedures/curbing wheels
- Continue working on driving skills and situations in various driving environments/routes

Supporting Learning Activities:

- ***Activities for the Student Driver while Behind the Wheel:***
 - [Instructor's Checklist for Driver's Performance](#)
- ***Activities for the Student Observers:***
 - [Instructor's Checklist for Observer's Participation](#)
 - [Activity 7.1](#)
 - [Activity 7.2](#)

Supporting Activities for Parents/Guardians to Complete with Their Student Driver:

- Associated Sections of Children’s Hospital of Philadelphia “*TeenDrivingPlan*” Practice Guide
- Associated National Safety Council “*DriveitHome*” Pointers for Parents

Assessment Tools:

- On-going Evaluation Sheet
- Student Card Rating Score 5-4-3-2-1
- Skill/Observation Scores
- Ask observers to watch for 2 skill strengths and 2 skill weaknesses that each driver might improve

SESSION 7 BTW SKILLS AND ACTIVITIES – SHARING THE ROAD

<i>Instructor's Checklist for Driver's Performance - check off the characteristics reviewed on various routes.</i>	
	Driver demonstrates appropriate use of SIPDE skills when encountering other roadway users on primary, and secondary streets and school zones
	Driver demonstrates appropriate use of SIPDE skills to anticipate and adjust for other roadway users when driving near business entrances and exits
	Driver demonstrates appropriate use of SIPDE skills to anticipate and adjust for other roadway users when driving near various urban and suburban intersections
	Driver demonstrates appropriate use of SIPDE skills to anticipate and adjust for other roadway users when driving in various parking lot situations, such as malls, a youth center, restaurants, a school, shopping center and grass field parking areas

<i>Instructor's Checklist for Observer's Participation - discuss and review the following topics with the observers in the vehicle.</i>	
	Ten Question Activity. Observers pick an index card with a word that is related to the “sharing the roadway” topic. The other observers in the backseat can take turns asking a question so that they can guess the selected word. (ambulance - Is it a vehicle? Is it a car? Is it a truck? Does it have a siren? Is it a police vehicle? etc.)
	Identify the motorcycles that the driver education vehicle encounters during the driving lesson and make note of where they track in the lane and how they communicate their intentions
	List a number of pedestrian moves and hazards that a driver may encounter and what to guard against

	Discuss the blind spots that are created inside the vehicle that may create obstructions for a driver's view of pedestrians
	Discuss where the "NO ZONE" area is when driving near a tractor trailer
	Complete Activity 7.1
	Complete Activity 7.2

Activity 7.1

Instructions: While in the driver education vehicle as an in-vehicle observer, discuss the following with your instructor.

- **Identify factors that put pedestrians at risk**
- **Explain the correct procedures for interacting with pedestrians in different situations**
- **Describe actions that pedestrians can take to ensure their own safety**
- **Explain why bicyclists are vulnerable on the roadway**
- **What actions a driver should take to help protect bicyclists**
- **Key ways that driving a motorcycle differs from driving a vehicle**
- **Explain why it is difficult to see motorcyclists**
- **Identify situations in which motorcyclists may be at risk or put drivers at-risk**
- **Describe how to follow, pass, and travel around large trucks**
- **List some precautions a driver must take when driving near school buses**
- **List some precautions a driver must take when driving near emergency vehicles**
- **List some precautions a driver must take when driving near recreational vehicles (RVs)**
- **List some precautions a driver must take when driving near snowplows and construction vehicle and workers**

Activity 7.2

Instructions: Observers will gather information about how other roadway users perform many different lateral maneuvers, such as lane changes, passing, pulling to and from curbs.

Observers should reflect on their observations and discuss any errors they believe these roadway users have made.

SESSION 8 BTW – THE PHYSICS OF DRIVING AND OCCUPANT RESTRAINT

Topics Addressed:

- Discuss the laws of physics and how it impacts driving a vehicle
- Understand and apply the laws of physics to mitigate risk while riding in a vehicle

Description of Suggested Driving Route:

- Intermediate traffic risk environment - urban, residential, rural, and highway areas
- “At-grade crossings”

Supporting Topics for Discussion:

- Gravity
- Center of gravity
- Inertia
- Centrifugal force
- Kinetic energy
- Vehicle suspension balance
- Friction
- Traction
- First collision
- Second collision
- Third collision
- Passive restraint
- Active restraint
- Seatbelt
- Car seat/booster seat
- Air bag
- NYS Seatbelt Law

Fundamental Driving Skills:

- Seat belt demonstration - force of impact

- Stopping distance = recognition, action braking distances
- Anti-lock brake system (ABS)
- Demonstration and understanding the effects of momentum, gravity, pitch, yaw, and roll
- Weight distribution discussion
- Muscle memory - Repetition - Mental rehearsal
 - Continue working on driving skills and situations in various driving environments and routes

Supporting Learning Activities:

- ***Activities for the Student Driver while Behind the Wheel:***
 - [Instructor's Checklist for Driver's Performance](#)
- ***Activities for the Student Observers:***
 - [Instructor's Checklist for Observer's Participation](#)
 - [Activity 8.1](#)
 - [Activity 8.2](#)

Supporting Activities for Parents/Guardians to Complete with Their Student Driver:

- Associated Sections of Children's Hospital of Philadelphia "[TeenDrivingPlan](#)" Practice Guide
- Associated National Safety Council "[DriveitHome](#)" Pointers for Parents

Assessment Tools:

- On-going Evaluation Sheet
- Student Card Rating Score 5-4-3-2-1
- Skill/Observation Scores
- Ask observers to watch for 2 skill strengths and 2 skill weaknesses that each driver might improve
- **Unit Grade** - Total Sessions 5-8 Score Sheets
 - Key: 25 x 4 = 100%, 20 x 4 = 80%, 15 x 4 = 60%, 10 x 4 = 40%
- [Unit 2 Evaluation Checklist](#)

SESSION 8 BTW SKILLS AND ACTIVITIES – THE PHYSICS OF DRIVING

<i>Instructor's Checklist for Driver's Performance - check off the characteristics reviewed and demonstrated on various routes.</i>	
	Explain and demonstrate understanding of the safety-related concepts of momentum, inertia, kinetic energy, gravity, friction and traction during various weather, night and daylight conditions
	Drivers and passengers use proper seat belt positions, steering wheel adjustments, mirror and seat adjustments
	Driver executes proper hand positions on steering wheel (8:00 and 4:00 o'clock positions) when driving
	Driver maintains at least 11 inches (sheet of paper) distance from the steering wheel when driving (airbag deploys with lower chance of injuring driver)

<i>Instructor's Checklist for Observer's Participation - discuss and review the following topics with the observers in the vehicle.</i>	
	Discuss the three collisions that occur in a crash (ex. the vehicle crashing into something, the occupants hitting the inside of the vehicle, and the occupants having internal organ trauma)
	Discuss what vehicle designers have done to mitigate trauma to occupants through engineering designs of the vehicle, the environment, and the ease of the driving controls, and tasks for the driver
	Complete Activity 8.1
	Complete Activity 8.2

Activity 8.1

Do you know what these terms mean?

- | | |
|----------------------|---|
| 1. inertia | a. friction between your tires and the road |
| 2. friction | b. energy of motion |
| 3. traction | c. causes objects to continue moving in a straight line |
| 4. momentum | d. the point about which weight is evenly distributed |
| 5. kinetic energy | e. force between two surfaces that resists the movement of one surface across the other |
| 6. center of gravity | f. the product of weight and speed |

1. When you brake quickly and your books and packages on the backseat fall onto the floor, the force at work is_____.
2. The force that makes your tires “stick to the surface of the road” is called_____.
3. Two vehicles going at the same speed hit the same brick wall, but the one that weighs more sustains much more damage. This is an example of_____.
4. The faster a vehicle moves, the more energy it has. True or False
5. The force that slows your vehicle going uphill is called_____.
6. What is kinetic energy? Look on your cell phone to find what the effects of kinetic energy are at various speeds.

Activity 8.2

Questions for backseat observer discussion:

1. Explain the total stopping distance terms: perception distance, reaction distance, and braking distance
2. Braking is a result of friction between the tires and road. What conditions can change the braking distance?
3. Is braking distance greater on a smooth road vs. a gravel road?
4. Does your braking distance decrease if you are going downhill?
5. Do you think that your ability to steer a vehicle depends partly upon the condition of the vehicle's suspension?
6. What is directional control of a vehicle? Is directional control the ability to hold a straight-line?
7. Is a banked road higher on the inside of curve than on the outside?
8. Is a crowned road higher in the center of the road or on the edges?
9. Use your phone to search centrifugal force and centripetal force. Report to your in-vehicle observers what the definitions are and what the differences are between them?
10. Describe how gravity affects your vehicle.

**Unit 2
(Sessions 5-8)**

BTW SKILLS – ASSESSMENT CHECKLIST

Assess the characteristics reviewed on various routes using 5-4-3-2-1 (5=Excellent to 1=Poor)

Driving Maneuvers	
	Executes proper stop sign procedure - stop line, staggered stop line, crosswalks, and stop signs only
	Properly navigates driving situations - right-of-way, yielding right-of-way, limited visibility, limited space and/or limited traction during various driving conditions
	Executes proper timing maneuvers, minimizing skills, separating skills, compromising skills, and off-road recovery skills when in suggested driving routes - rural roads, rural highways, business districts, shopping malls, and shared left or right turn lanes
Driving in Different Environments	
	Explains and demonstrates safety considerations needed when changing lanes, cruising, and entering/exiting roadways
	Explains and executes proper safety when in suggested driving routes - expressway, rural, residential, urban, or business environments
	Executes safe and proper following distances in various weather conditions (4 second rule on the interstate, 2-3 seconds in perfect conditions, 12+ second rule on ice)
Sharing the Road	
	Demonstrates improved SIPDE skills when driving on primary and secondary streets and school zones
	Demonstrates improved SIPDE skills when driving in business/strip mall entrances and exits
	Demonstrates improved SIPDE skills when driving in various urban, suburban and city intersections
The Physics of Driving and Occupant Restraint	
	Uses proper seat belt positions, steering wheel adjustments, mirror adjustments, and seat adjustments.

	Executes proper hand position on steering wheel (8:00 and 4:00/9:00 and 3:00 o'clock positions) when driving and leaves proper distance between body and steering wheel (at least 11 inches)
	Explains and demonstrates understanding of momentum, inertia, kinetic energy, gravity, friction and traction during various weather (night and daylight conditions)
	Overall Assessment of Driving Skills to Date 5-4-3-2-1 (5=Excellent to 1=Poor)
NOTES	