CE 353
PRINCIPLES OF TRANSPORTATION AND TRAFFIC ENGINEERING

Tractive Effort and Resistance:

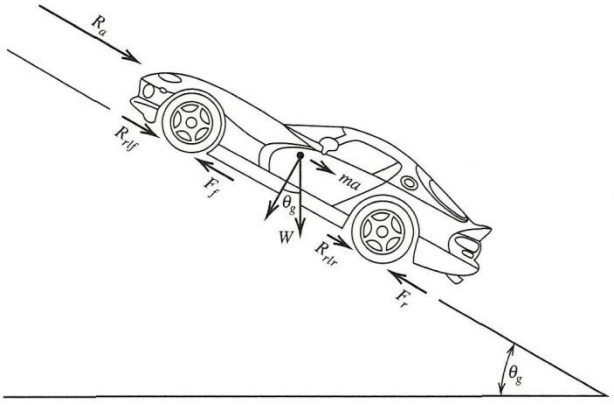

Figure 2.1 Forces acting on a road vehicle

F_f = available tractive force of the front tires (N)
F_r = available tractive force of the rear tires (N)
a = acceleration (m/s^2)
R_a = aerodynamic resistance (N)
R_{rlf} = rolling resistance of the front tires (N)
R_{rlr} = rolling resistance of the rear tires (N)
R_g = the grade resistance, ($WSin\theta_g$) (N)

Braking:

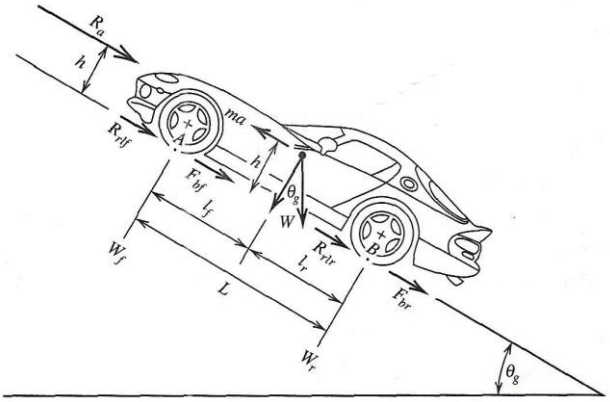

Figure 2.2 Forces acting on a vehicle during braking.

R_a = aerodynamic resistance (N)
F_{bf} = braking force of the front tires (N)
F_{br} = braking force on the rear tires (N)
W = total weight of the vehicle (N)
W_f = weight of the vehicle on the front axle (N)
W_r = weight of the vehicle on the rear axle (N)
L = length of wheelbase (m)
h = height of the center of gravity above the road surface (m)
L_f = distance from the front axle to the center of gravity (m)
L_r = distance from the rear axle to the center of gravity (m)