

INDEX

Note: Index has not been updated to reflect revisions to Chapters 2, 5 and new 11.

A

AASHTO Green Book, 3-21
acceleration of the lead car, fluctuation in the, 4-8
acceleration control, 3-24
acceleration noise, 7-8
actuated signals, 9-23
adaptive signals, 9-19
adaptive signal control, 9-27
aerial photography, 2-3, 6-11
aerodynamic conditions, 7-9
aero-dynamic effects, 7-11
age, 3-16
aggregated data, 6-3
aggressive driving, 6-20
aging eyes, 3-16
air pollutant levels, 7-15
air pollutants, 7-13, 7-14
air pollution, 7-13
air quality standards, 7-14, 7-15
air quality models, 7-15
air quality, 7-13, 7-15
air resistance, 7-12
 α -relationship, 6-12
alternative fuel, 7-15
alternative fuels, 7-12
altitude, 7-8, 7-8
ambient temperature, 7-8, 7-8
Ambient Air Quality Standards, 7-13
analytical solution, 5-3, 5-3, 5-9
arrival and departure patterns, 5-9, 5-9
arterials, 5-6, 5-9
Athol, 2-2, 2-10, 2-22
auxiliary electric devices, 7-8
average block length, 6-20, 6-20, 6-22
average cycle length, 6-20
average flows, 6-8
average maximum running speed, 6-17
average number of lanes per street, 6-20, 6-22
average road width, 6-6
average signal cycle length, 6-20, 6-23
average signal spacing, 6-10
average space headway, 5-6, 5-6
average speed, 6-3, 6-6, 6-8, 6-10, 6-11, 6-17, 6-22, 7-9, 7-11
average speed limit, 6-20
average street width, 6-10, 6-11

B

ballistic, 3-8
bifurcation behavior, 5-15
block length, average, 6-20, 6-20, 6-22
blockages per hour, 6-22
boundary, 5-4, 5-4, 5-10-5-11, 5-23, 5-24, 5-36
brake and carburetion systems, 7-8
braking inputs, 3-7
braking performances, 3-20, 4-1
braking performance reaction time, 3-5

C

California standards, 7-15
CALINE-4 dispersion model, 7-15
capacity, 4-1
carbon monoxide, 7-13
car-following, 10-2, 10-3, 10-8, 10-15
car following models, 4-1
catastrophe theory, 2-8, 2-27, 2-28
central city, 6-8
central vs. peripheral processes, 3-17
changeable message signs, 3-12
changes in cognitive performance, 3-17
changes in visual perception, 3-16
chase car, 6-21, 6-22
Clean Air Act, 7-13, 7-13
closed-loop braking performance, 3-21
coefficient of variation, 3-11
cognitive changes, 3-16
collective flow regime, 6-16
composite emission factors, 7-15
compressibility, 5-1, 5-9
compressible gases, 5-22, 5-22
computer simulation, 6-22, 6-23
concentration, 2-1, 2-5, 2-8, 2-20, 2-29, 4-15, 6-16, 6-17, 6-20, 6-23
concentration at maximum flow, 6-25
conditions, 5-4, 5-6-5-9, 5-11, 5-23, 5-27, 5-29-5-30, 5-32, 5-36, 5-38, 5-43, 5-45
confidence intervals, 10-17, 10-17, 10-20, 10-21, 10-26
congested operations, 2-11, 2-22
continuity equation, 5-1-5-3, 5-20, 5-22, 5-24, 5-25
continuous simulation models, 10-3
continuum models, 5-1-5-1, 5-3, 5-20, 5-29, 5-41
control, 3-1, 4-2
control movement time, 3-7, 3-7
control strategies, 6-22

convection motion and relaxation, 5-20
convection term, 5-20, 5-22
convergence, 5-11
coordinate transformation method., 9-11
correlation methods, 10-22, 10-22
critical gap values for unsignalized intersections, 3-26
cruising, 7-11
cruising speed, 7-11

D

deceleration-acceleration cycle, 7-11, 7-11
decision making, 4-2
defensive driving, 3-17-3-17
delay models at isolated signals, 9-2
delay per intersection, 6-10
density, 1-4-1-4, 2-1- 2-3, 2-7, 2-11, 2-18, 2-21, 2-28
density and speed, 2-3, 2-22
disabled drivers, 3-2
discontinuity, 5-1, 5-4
discrete simulation models, 10-3
discretization, 5-10, 5-10-5-14, 5-26, 5-30, 5-34
display for the driver, 3-2
dissipation times, 5-8
distractors on/near roadway, 3-28
disturbance, 4-15
Drake et al., 2-7, 2-12, 2-20, 2-23, 2-24, 2-28, 2-36
driver as system manager, 3-2
driver characteristics, 7-8
driver performance characteristics, 3-28
driver response or lag to changing traffic signals, 3-9
drivers age, 3-16
driving task, 3-9, 3-28
drugs, 3-17-3-17

E

Edie, 2-6, 2-18, 2-32, 2-34
effective green interval, 5-6, 5-8
effective red interval, 5-8
electrification, 7-15
Elemental Model, 7-9, 7-11
emission control, 7-14
emissions, 7-13
energy consumption, 7-8, 7-12
energy savings, 7-8
engine size, 7-8, 7-12
engine temperature, 7-8

entrance or exit ramps, 5-12
equilibrium, 5-1-5-1, 5-3, 5-10, 5-22-5-23, 5-45
ergodic, 6-17
evasive maneuvers, 3-15
expectancies, 3-7
exposure time, 3-13

E

figure/ground discrimination, 3-17, 3-17
filtering effect on signal performance, 9-17
first and second moments, 5-22
Fitts' Law, 3-7, 3-7
fixed-time signals , 9-23
floating car procedure, 2-3
floating vehicles, 6-11
flow, 1-4, 1-4, 2-1, 2-7, 2-10, 2-16, 2-18, 2-24, 2-26, 2-32, 2-34, 4-1
flow-concentration relationship, 4-15
flow rates, 2-2, 2-4-2-5, 2-14, 2-32, 5-3, 5-6, 5-10, 5-12, 5-13, 5-19, 5-24, 5-25
forced pacing under highway conditions, 3-17
fraction of approaches with signal progression, 6-20
fraction of curb miles with parking, 6-20, 6-23
fraction of one-way streets, 6-20, 6-20, 6-22
fraction of signalized approaches in progression, 6-23
fraction of signals actuated, 6-20
fraction of vehicles stopped, 6-17, 6-23
free-flow speed, 6-9
fuel consumption, 6-23, 7-8, 7-9, 7-12
fuel consumption models, 7-8
fuel consumption rate, 7-8, 7-9, 7-11
fuel efficiency, 7-8, 7-9, 7-12
fundamental equation, 2-8, 2-10

G

gap acceptance, 3-10, 3-25
gasoline type, 7-8
gasoline volatility, 7-15
Gaussian diffusion equation, 7-15
gender, 3-16, 3-16
glare recovery, 3-17
"good driving" rules, 4-1
grades, 7-8
Greenberg, 2-20, 2-20, 2-21, 2-34
Greenshields, 2-18, 2-18, 2-34
guidance, 3-1

H

headways, 2-2, 2-2, 2-3, 2-8
Hick-Hyman Law, 3-3
high order models, 5-1-5-1, 5-15
Highway Capacity Manual, 4-1
highway driving, 7-11
Human Error, 3-1
humidity, 7-15
hysteresis phenomena, 5-15

I

identification, 3-9, 3-15
idle flow rate, 7-12
idling, 7-11, 7-11
Index of Difficulty, 3-8
individual differences in driver performance, 3-16
infinitesimal disturbances, 4-15
information filtering mechanisms, 3-17
information processor, 3-2
initial and boundary conditions, 5-5, 5-5, 5-6, 5-11
inner zone, 6-10
inspection and maintenance, 7-15
instantaneous speeds, 7-12
interaction time lag, 5-12, 5-12, 5-13
intersection capacity, 6-11
intersection density, 6-20
intersections per square mile, 6-20
intersection sight distance, 3-10, 3-27
Intelligent Transportation Systems (ITS),
2-1-2-2, 2-5, 2-6, 2-8, 2-19-2-20, 2-24,
2-32-2-33, 3-1, 6-25

J

jam concentration, 4-14
jam density, 5-3, 5-8, 5-11-5-14

K

kinetic theory of traffic flow, 6-16

L

lane-changing, 10-5
lane miles per square mile, 6-20

lead (Pb), 7-13
legibility, 3-9
levels of service, 6-2
light losses and scattering in optic train, 3-16
local acceleration, 5-20, 5-26
log-normal probability density function, 3-5
looming, 3-13
loss of visual acuity, 3-16

M

macroscopic, 6-1
macroscopic measure, 6-16
macroscopic models, 6-6
macroscopic relations, 6-25
macular vision, 3-17
maximum average speed, 6-3
maximum flow, 6-11
May, 2-2-2-7, 2-9, 2-12, 2-22, 2-24, 2-33, 2-36
measurements along a length of road, 2-3
Measures of Effectiveness, 10-17, 10-17, 10-25
medical conditions, 3-18
merging, 3-25
meteorological data, 7-15
methanol, 7-15
microscopic, 6-22
microscopic analyses, 6-1
minimum fraction of vehicles stopped, 6-25
minimum trip time per unit distance, 6-17, 6-17 mixing
zone, 7-16
method of characteristics, 5-4
model validation, 10-5
model verification, 10-5, 10-15
momentum equation, 5-1-5-1, 5-22, 5-26, 5-29
motion detection in peripheral vision, 3-14
movement time, 3-7
moving observer method, 2-3, 2-3
MULTSIM, 7-12

N

navigation, 3-1
NETSIM, 6-22, 6-23
network capacity, 6-6
network topology, 6-1
network concentrations, 6-22, 6-24
network features, 6-20, 6-20
network-level relationships, 6-23
network-level variables, 6-25

network model, 6-1, 6-6
network performance, 6-1
network types, 6-6
network-wide average speed, 6-8
nighttime static visual acuity, 3-11
nitrogen dioxide, 7-13
non-instantaneous adaptation, 5-23
non-linear models, 4-15
normal or gaussian distribution, 3-5
normalized concentration, 4-15
normalized flow, 4-15
number of lanes per street, 6-20
number of stops, 6-23, 7-8
numerical solution, 5-9, 5-11, 5-12, 5-29, 5-31-5-33,
5-49

Q

object detection, 3-15
obstacle and hazard detection, 3-15
obstacle and hazard recognition, 3-15
obstacle and hazard identification, 3-15
occupancy, 1-4, 2-1, 2-9, 2-11, 2-21, 2-22,
2-25-2-26, 2-28, 2-32, 2-34, 2-36
off-peak conditions, 6-6
Ohno's algorithm, 9-8
oil viscosity, 7-8
oncoming collision, 3-13
open-loop, 3-8
open-loop braking performance, 3-20
oscillatory solutions, 5-15
outer zone, 6-10
overtaking and passing in the traffic stream, 3-24
overtaking and passing vehicles, 3-24
overtaking and passing vehicles (Opposing Traffic),
3-25
oxygenated fuels/reformulated gasoline, 7-15
ozone, 7-13

P

partial differential equation, 5-4, 5-30
particulate matter, 7-13
pavement roughness, 7-8
pavement type, 7-8
peak conditions, 6-6
perception-response time, 3-3
peripheral vs. central processes, 3-17
perception, 4-2

period of measurement, 7-15
"Plain Old Driving" (POD), 3-1
platoon dynamics, 5-6
platooning effect on signal performance, 9-15
pollutant dispersion, 7-16
Positive Guidance, 3-28
positive kinetic energy, 7-11
pupil, 3-16

Q

quality of service, 6-20, 6-25
quality of traffic service, 6-12, 6-16
queue, 5-4, 5-7, 5-50
queue discharge flow, 2-12, 2-13, 2-15
queue length, 5-6, 5-9
queue length stability, 5-8

R

radial motion, 3-13
random numbers, 10-2-10-2, 10-22, 10-26
reaction time, 3-3, 3-3, 3-4, 3-7, 3-8, 3-16, 3-17
real-time driver information input, 3-28
refueling emissions controls, 7-15
relaxation term, 5-23
resolving power, 3-11
response distances and times to traffic control
devices, 3-9
response time, 3-4, 3-7, 3-15, 3-16, 3-20
response to other vehicle dynamics, 3-13
road density, 6-15
roadway gradient, 7-8
rolling friction, 7-9
rolling resistance, 7-12
running (moving) time, 6-17
running speed, 6-10, 6-10, 6-11

S

saturation flow, 6-10
scatter in the optic train, 3-17
scattering effect of, 3-17
senile myosis, 3-16
sensitivity coefficient, 4-15, 5-12, 5-12
shock waves, 5-1, 5-1, 5-3-5-4, 5-6, 5-29, 5-30, 5-50
signalized intersection, 5-6, 5-6, 5-7
signalized links and platoon behavior, 5-9

- short-term events, 6-22
- signals,
 - actuated, 9-23
 - adaptive, 9-19
- signal control, adaptive, 9-27
- signal densities, 6-10
- signal density, 6-20
- signals per intersection, 6-22
- sign visibility and legibility, 3-11
- signage or delineation, 3-17
- simulation models, building 10-5
- site types, 7-15
- smog, 7-13
- Snellen eye chart, 3-11
- sound velocity, 5-22
- source emissions, 7-14
- space headway, 2-1, 2-5
- space mean speed, 2-6-2-7, 2-9-2-10, 6-15, 7-11
- spacing, 2-1, 2-1, 2-26, 4-8, 5-2, 5-17, 5-29, 5-34
- specific maneuvers at the guidance level, 3-24
- speed, 2-3, 2-6, 2-8, 2-11, 2-14, 2-16, 2-18, 2-22, 2-24, 2-28, 2-31, 2-33, 4-1, 4-15
- speed (miles/hour) versus vehicle concentration (vehicles/mi), 4-17
- speed and acceleration performance, 3-24
- speed-concentration relation, 4-13
- speed-density models, 2-19
- speed-density relation, 5-15-5-15, 5-20, 5-22-5-23, 5-27, 5-34
- speed-flow models, 2-13, 2-1, 9 6-8
- speed-flow relation, 6-6
- speeds from flow and occupancy, 2-8, 2-9
- speed limit changes, 3-28
- speed noise, 7-8, 7-12
- speed of the shock wave, 5-4
- speed-spacing, 4-15
- speed-spacing relation, 4-1
- spillovers, 5-9
- stability analysis, 5-8, 5-25, 5-28-5-29, 5-43
- standard deviation of the vehicular speed distribution, 5-22, 5-39
- state equations, 5-9, 5-9
- State Implementation Plans (SIPs), 7-15
- stationary sources, 7-13
- statistical distributions, 10-5, 10-6
- steady-state, 7-11
- steady-state delay models, 9-3
- steady-state expected deceleration, percentile estimates of, 3-21
- steady-state flow, 4-15
- steady-state traffic speed control, 3-24
- steering response times, 3-9, 3-9

- stimulus-response equation, 4-3
- stochastic process, 10-17
- stochastic simulation, 10-5
- stop time, 6-17, 6-17
- stopped time, 6-10
- stopped delay, 7-11
- stopping maneuvers, 3-15
- stopping sight distance, 3-26
- stop-start waves, 5-15-5-15, 5-17, 5-24, 5-26, 5-36, 5-39
- street network, 6-20
- structure chart, 10-8
- substantial acceleration, 5-20, 5-20
- sulfur dioxide, 7-13
- summer exodus to holiday resorts, 5-17
- surface conditions, 7-8
- suspended particulate, 7-13

I

- tail end, 5-6-5-8
- temperature, 7-15
- time-dependent delay models, 9-10
- time headway, 2-1
- time mean speed, 2-6-2-7
- tire pressure, 7-8
- tire type, 7-8
- total delay, 6-23
- total trip time, 6-17
- TRAF-NETSIM, 6-22, 6-23
- traffic breakdowns, 5-15, 5-42
- traffic conditions, 7-9
- traffic control devices (TCD), 3-9
- traffic control system, 6-1
- traffic data, 7-15
- traffic dynamic pressure, 5-23
- traffic intensity, 6-2, 6-15
- traffic network, 6-1
- traffic performance, 6-1
- traffic signal change, 3-9
- traffic simulation, 10-1-10-2, 10-4, 10-7, 10-15-10-17, 10-20, 10-22
- traffic stream, 4-1
- trajectories of vehicles, 5-4
- trajectory, 5-4, 5-7-5-9
- transients, 5-15-5-15, 5-17, 5-20
- transmission type, 7-8
- travel demand levels, 6-1
- travel time, 6-1, 6-10
- trip time per unit distance, 7-9
- two-fluid model, 6-1, 6-17, 6-22-6-23, 6-25

two-fluid parameters, 6-18, 6-18, 6-20, 6-23, 6-25
two-fluid studies, 6-20
two-fluid theory, 6-12, 6-16, 6-24
turning lanes, 5-9, 5-9

U

undersaturation, 5-8
effect of upstream signals, 9-15
UMTA, 7-15
UMTA Model, 7-15
urban driving cycle, 7-11
urban roadway section, 7-11
uncongested flows, 2-12

V

variability among people, 3-16
vehicle ahead, 3-13
vehicle alongside, 3-14
vehicle characteristics, 7-8
vehicle emissions, 7-14
vehicle fleet, 7-8
vehicle mass, 7-8, 7-9, 7-12

vehicle miles traveled, 6-11
vehicle shape, 7-8
vehicles stopped ,average fraction of the, 6-17
viscosity, 5-22, 5-24, 5-29, 5-34
visual acuity, 3-11
visual angle, 3-11-3-13, 3-15, 3-16
visual performance, 3-11
volatile organic compounds, 7-13

W

Wardrop, 2-4, 2-4, 2-6-2-7
Wardrop and Charlesworth, 2-4, 2-4
Weber fraction, 3-13, 3-13
wheel alignment, 7-8
wind, 7-8
wind conditions, 7-8
wind speed, 7-15
work zone traffic control devices, 3-17

Y

yield control for secondary roadway, 3-27