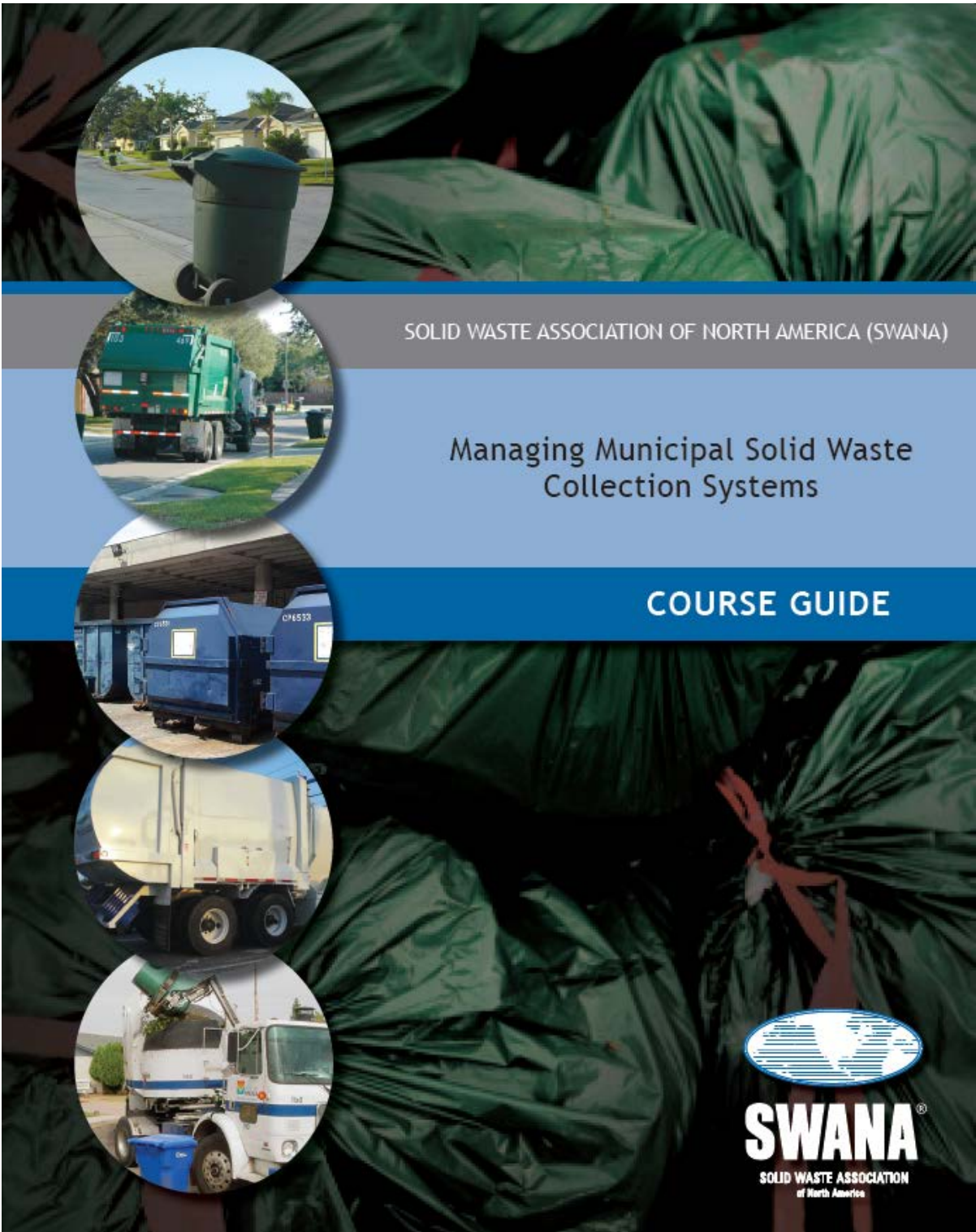




SOLID WASTE ASSOCIATION OF NORTH AMERICA (SWANA)

Managing Municipal Solid Waste Collection Systems

COURSE GUIDE



SWANA[®]
SOLID WASTE ASSOCIATION
of North America

CONTENTS

LESSON 1: THE NEED for SOLID WASTE COLLECTION

LESSON OBJECTIVES.....	1-1
THE PRIMARY NEED FOR COLLECTION	1-2
GOVERNMENTAL ROLES AND RESPONSIBILITIES	1-3
PRIVATE SECTOR	1-4
SUMMARY	1-5
LESSON REVIEW	1-6

LESSON 2: WASTE STREAM CHARACTERIZATION

LESSON OBJECTIVE	2-1
SOLID WASTE CUSTOMER TYPES.....	2-1
RESIDENTIAL SOLID WASTE (RSW) STREAM.....	2-1
TOTAL MSW GENERATION	2-2
MIXED SOLID WASTE	2-3
RECYCLABLES	2-3
YARD WASTE	2-4
BULKY WASTE	2-4
HOUSEHOLD HAZARDOUS WASTE.....	2-5
MATERIAL BANNED FROM LANDFILL DISPOSAL	2-6
OTHER RESIDENTIAL WASTE CLASSIFICATIONS.....	2-6
RESIDENTIAL SOLID WASTE QUANTITIES	2-8
RESIDENTIAL SOLID WASTE GENERATION RATES	2-9
SEASONAL FLUCTUATION	2-11
DAILY FLUCTUATIONS.....	2-11
GENERATION RATES	2-12
PARTICIPATION RATES AND SET-OUT WEIGHTS.....	2-13
SOLID WASTE CHARACTERISTICS	2-16
PHYSICAL CHARACTERISTICS.....	2-18
SUMMARY	2-18
LESSON REVIEW	2-19

LESSON 3: SOLID WASTE COLLECTION EQUIPMENT

LESSON OBJECTIVES.....	3-1
THREE BASIC TYPES OF VEHICLE CHASSIS	3-2
CHASSIS TYPE FRAMES	3-3
CLASSIC COLLECTION VEHICLE BODIES.....	3-4
UNLOADING COLLECTION BODIES	3-4
BODY SPECIFICATIONS	3-6
CHASSIS SPECIFICATIONS	3-7
AUTOMATED COLLECTION VEHICLES.....	3-11
ROLL OFF COLLECTION.....	3-15
STATIONARY AND SELF-CONTAINED COMPACTORS	3-16
SUMMARY	3-17
LESSON REVIEW	3-18

LESSON 4: EQUIPMENT SPECIFICATION

LESSON OBJECTIVES.....	4-1
CHASSIS SPECIFICATIONS	4-2

BODY SPECIFICATIONS	4-5
WARRANTY	4-10
TRAINING	4-11
DOCUMENTATION	4-11
CONTAINER SPECIFICATIONS	4-12
COMPACTOR SPECIFICATIONS	4-13
NATIONAL INTERGOVERNMENTAL PURCHASING ALLIANCE	4-16
SUMMARY	4-17

LESSON 5: SOLID WASTE COLLECTION SERVICES and VARIABLES

LESSON OBJECTIVES.....	5-1
TYPES OF RESIDENTIAL WASTE COLLECTION SERVICES	5-1
SERVICE LEVELS.....	5-4
PERIODIC COLLECTION SERVICES	5-7
COLLECTION SERVICE DELIVERY METHODS.....	5-8
COMMERCIAL WASTE SOURCES	5-16
COMMERCIAL WASTE/RECYCLING COLLECTION	5-17
SERVICE DELIVERY VARIABLES	5-17
FACTORS IN SELECTING CONTAINERS.....	5-19
CONTAINER OPTIONS	5-20
COLLECTION DAYS.....	5-21
SET OUT LOCATIONS	5-22
COLLECTION FREQUENCY.....	5-22
FACTORS INFLUENCING PROVISION OF COLLECTION SERVICES.....	5-23
TYPES OF PROCESSING AND DISPOSAL SYSTEMS	5-25
OTHER FACTORS	5-27
SUMMARY	5-27
LESSON REVIEW	5-28

LESSON 6: EQUIPMENT MANAGEMENT

LESSON OBJECTIVES.....	6-1
EQUIPMENT MANAGEMENT	6-1
LIFE CYCLE OF SOLID WASTE COLLECTION VEHICLES.....	6-3
EQUIPMENT SPECIFICATION AND PROCUREMENT.....	6-5
EQUIPMENT AND BACKUP UTILIZATION.....	6-9
EQUIPMENT MAINTENANCE	6-10
RECORDS NEEDED FOR GOOD MAINTENANCE	6-12
KEYS TO A GOOD MAINTENANCE PROGRAM.....	6-15
MAINTENANCE SERVICE PROVIDERS.....	6-15
PUBLIC EQUIPMENT SERVICE PROVIDERS	6-16
SUMMARY	6-18
LESSON REVIEW	6-19

LESSON 7: DEVELOPING A SOLID WASTE COLLECTION PLAN

LESSON OBJECTIVES.....	7-1
DEVELOPING A SOLID WASTE COLLECTION PLAN	7-1
KEYS TO A SOLID WASTE COLLECTION PLAN.....	7-1
8 STEPS TO DEVELOPING A COLLECTION PLAN AND STRATEGY	7-3
SUMMARY	7-12
LESSON REVIEW	7-13

LESSON 8: COLLECTION SYSTEM DESIGN

LESSON OBJECTIVES.....	8-1
COLLECTION SYSTEM DESIGN	8-1
COLLECTION SYSTEM SERVICE AND DESIGN STEPS	8-2
STEP ONE: IDENTIFY POTENTIAL COLLECTION METHOD	8-3
STEP TWO: GATHER RELEVANT DATA	8-4
STEP THREE: DETERMINE PRODUCTIVITY LEVEL FOR EACH COLLECTION METHOD	8-5
STEP FOUR: ESTIMATE COSTS FOR EACH COLLECTION METHOD	8-11
STEP FIVE: IDENTIFY AND INVESTIGATE OTHER FACTORS.....	8-16
STEP SIX: SELECT METHOD FOR EACH COLLECTION SERVICE	8-17
SUMMARY	8-17
LESSON REVIEW	8-18

LESSON 9: COLLECTING TRUCK ROUTING and EMERGING TECHNOLOGIES

LESSON OBJECTIVES.....	9-1
COLLECTION TRUCK ROUTING AND EMERGING TECHNOLOGIES.....	9-2
TIME IS OF THE ESSENCE.....	9-3
LAY OF THE LAND AND OTHER FACTORS	9-4
TWO BASIC ROUTING TECHNIQUES	9-5
REVIEWING PROGRAMS AND MAKING DECISIONS	9-6
ROUTE PRODUCTIVITY.....	9-8
MANUAL PATH ROUTING	9-12
AUTOMATED ROUTING.....	9-12
ROUTING APPLICATIONS.....	9-13
INSTALLING ROUTING APPLICATIONS.....	9-14
LESSON REVIEW	9-16

LESSON 10: SAFETY and COMPLIANCE

LESSON OBJECTIVES.....	10-1
SAFETY AND COMPLIANCE	10-1
REASONS FOR COLLECTION ACCIDENTS AND INJURIES	10-2
SAFETY AND SOLID WASTE COLLECTION MANAGERS.....	10-2
MANAGEMENT SAFETY PHILOSOPHY.....	10-3
MANAGEMENT RESPONSIBILITIES REGARDING SAFETY.....	10-3
SUPERVISORY RESPONSIBILITIES REGARDING SAFETY.....	10-4
EMPLOYEE RESPONSIBILITIES REGARDING SAFETY.....	10-4
CUSTOMER RESPONSIBILITIES REGARDING SAFETY	10-5
ACCIDENT/INCIDENT REPORTING AND RECORDING	10-5
IMPROVING SAFETY IN LOADING OF SOLID WASTE.....	10-6
EDUCATE EMPLOYEES ABOUT COLLECTION SAFETY HAZARDS	10-7
APPROPRIATE ATTIRE	10-7
PROPER LIFTING	10-7
SAFETY IN VEHICLE OPERATION	10-9
SAFETY INSPECTION	10-9
EQUIPMENT SAFETY AND OPERATION RULES.....	10-10
OSHA INSPECTION PROGRAMS.....	10-11
REQUIRED SAFETY TRAINING	10-12
SUMMARY	10-13
LESSON REVIEW	10-14

LESSON 11: PERSONNEL and ORGANIZATION MANAGEMENT

LESSON OBJECTIVES.....	11-1
PERSONNEL AND ORGANIZATION MANAGEMENT	11-1
APPLICABLE LAWS AND REGULATIONS	11-1
PURPOSE OF THE COLLECTION SERVICES ORGANIZATION	11-3
TYPICAL LOCAL GOVERNMENT MANAGEMENT STRUCTURE	11-4
TYPES OF ORGANIZATIONS	11-5
BENCHMARKING	11-7
PERSONNEL MANAGEMENT	11-9
PRINCIPLES OF EFFECTIVE PERSONNEL MANAGEMENT	11-9
FINANCIAL COMPENSATION OPTIONS FOR COLLECTION EMPLOYEES	11-10
DETERMINATION OF COMPARABLE PAY	11-12
FRINGE BENEFITS	11-12
COLLECTION SYSTEM TRAINING	11-13
EMPLOYEE HANDBOOKS	11-13
DOT TESTING.....	11-14
PRACTICES FOR HANDLING EMPLOYEE GRIEVANCE	11-15
SUMMARY	11-15
LESSON REVIEW	11-16

LESSON 12: CONTRACTING and MANAGED COMPETITION for COLLECTION SERVICES

LESSON OBJECTIVES.....	12-1
CONTRACTING FOR COLLECTION SERVICES	12-1
DECIDING TO CONTRACT FOR COLLECTION SERVICES.....	12-3
RISKS OF CONTRACTING FOR COLLECTION SERVICES	12-3
REWARDS FOR CONTRACTING FOR COLLECTION SERVICES.....	12-4
STRATEGIES TO ENSURE COMPETITION	12-5
COMPETITIVE PROCUREMENT OF CONTRACT COLLECTION SERVICES.....	12-6
THE MANAGED COMPETITION PROCUREMENT METHOD	12-7
MANAGED COMPETITION – IMPLEMENTATION GUIDELINES	12-8
COMPETITIVE PROCUREMENT OF GOODS AND SERVICES	12-10
SINGLE STAGE COMPETITIVE BID/PROPOSAL OPTION – PROCUREMENT STEPS.....	12-12
TWO STAGE COMPETITIVE BID/PROPOSAL OPTION – PROCUREMENT STEPS.....	12-13
COMPETITIVE NEGOTIATION PROCUREMENT METHOD	12-14
REQUEST FOR QUALIFICATIONS	12-14
BID/PROPOSAL REQUIREMENTS TYPICALLY WAIVED FOR PUBLIC SECTOR PROPOSERS.....	12-15
SERVICE CONTRACT ELEMENTS	12-17
CONTRACT MANAGEMENT – START UP TASKS	12-24
COMPLIANCE WITH CONTRACT SPECIFICATIONS	12-25
SUMMARY	12-31
LESSON REVIEW	12-32