

HazMat Transportation Compliance

September 2017

My HazMat Journey



Biology
Environmental Studies



Freshwater Sciences

Booz | Allen | Hamilton



Labelmaster – One Stop DG Shop

LABELMASTER[®] **PRODUCTS**

- 30,000+ products with core capabilities in dangerous goods labels, placards, and packaging
- Tens of thousands of customers across a wide variety of industries

LABELMASTER[®] **SOFTWARE**

- Twenty years experience building technology solutions to simplify the process of shipping dangerous goods
- Flagship product is the Dangerous Goods Information System (DGIS)

LABELMASTER[®] **SERVICES**

- Team of regulatory and operating experts with deep experience across industries
- Consulting services include:
 - Compliance audits
 - Classification
 - Regulatory interpretations
 - Training strategies and development

HazMat Shipping Process

DOT Enforcement

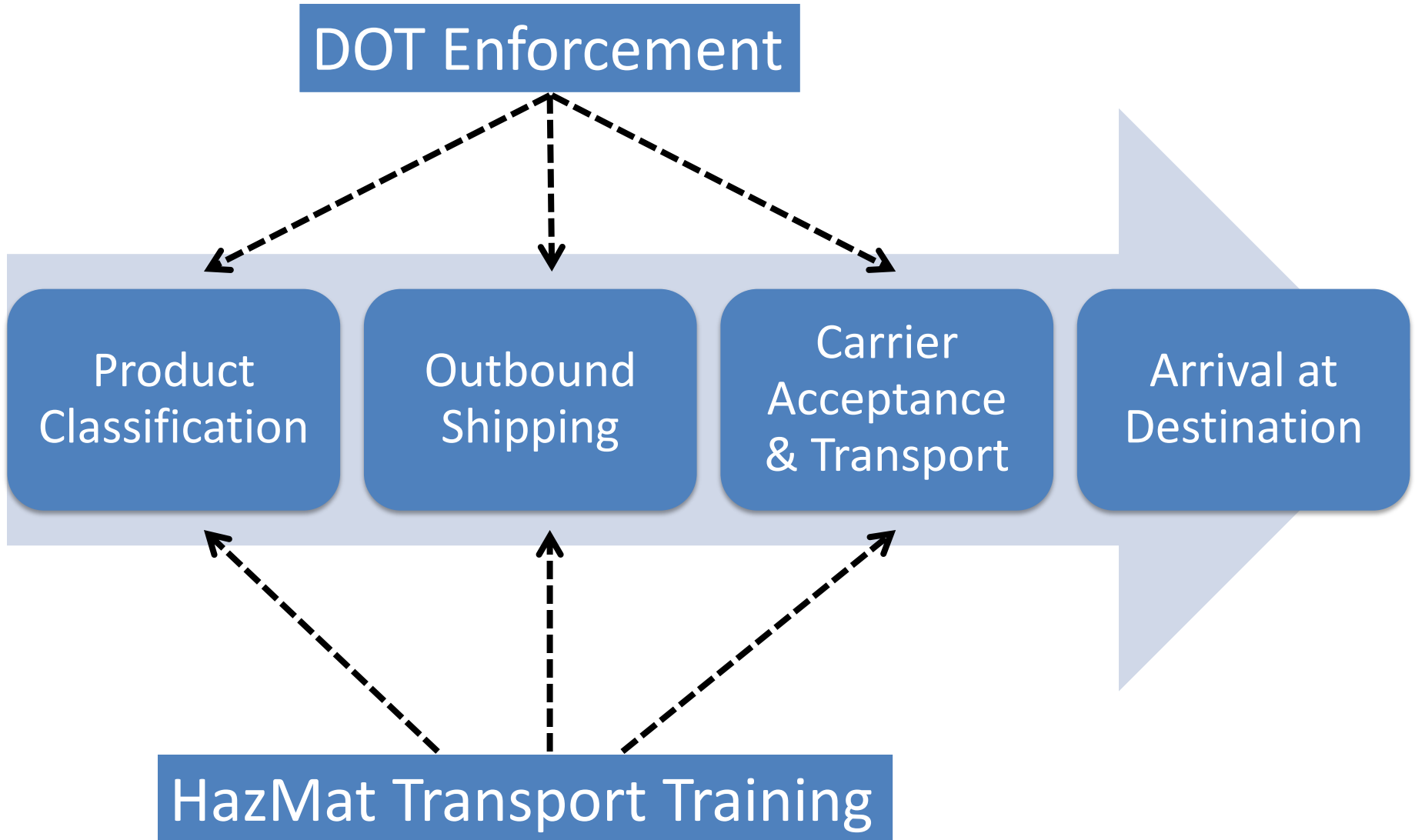
Product
Classification

Outbound
Shipping

Carrier
Acceptance
& Transport

Arrival at
Destination

HazMat Transport Training



HazMat Shipping Process

Product
Classification

Outbound
Shipping

Carrier
Acceptance
& Transport

Arrival at
Destination

The Nine (9) Hazard Classes

Hazardous Materials: Articles or substances that pose a risk to health, safety, and property when transported

Explosives



Gases



Flammable Liquids



Flammable Solids



Oxidizers & OP



Poison & IS



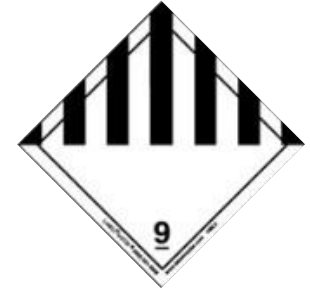
Radioactive



Corrosives



Miscellaneous



Hazard Classification

Transport Safety Relies on Correct Classification

How do I classify materials for transportation?



Section 14



49 CFR Part 173

14. Transport information

DOT

UN number:	UN 1219
UN proper shipping name:	Isopropyl Alcohol
Transport hazard class(es)	
Class(es):	3
Label(s):	3
Packing group:	II
Marine Pollutant:	No

Hazard Classification

Build Product HazMat Data Set:

- UN Number & Proper Shipping Name
- Hazard Class
- Packing Group
- Weight/Volume of SKU
- Flash point (Class 3)
- Battery attributes (lithium batteries)

Classification Challenges



**Articles not subject
to SDS requirements**

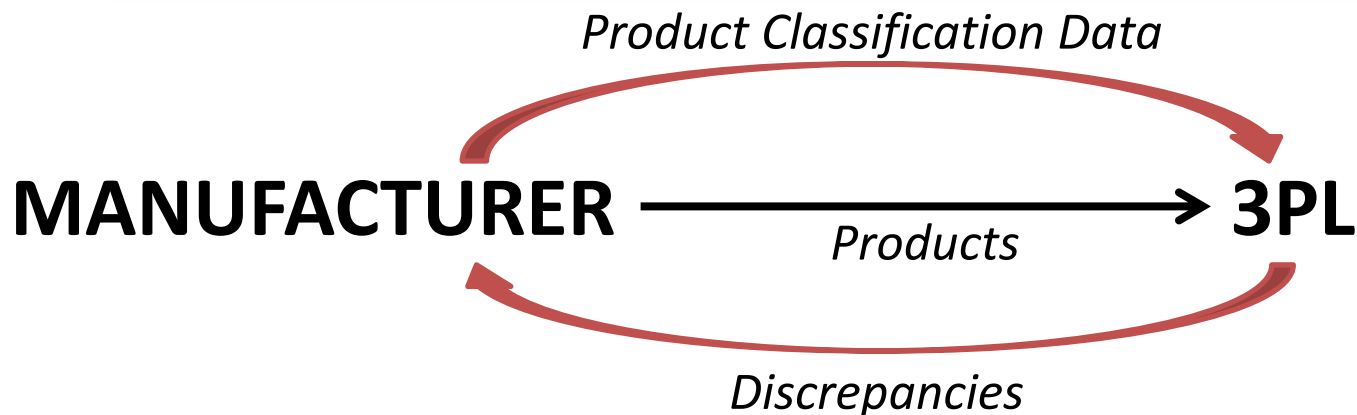


**Gathering classification
info on large inventories**

Bad Information

14. Transport information

See Bill-of-Lading.



HazMat Shipping Process

Product
Classification

Outbound
Shipping

Carrier
Acceptance
& Transport

Arrival at
Destination

“Fully Regulated” v. Exceptions

Fully Regulated

“Everything is required unless it’s not”

- ✓ UN Performance Package
- ✓ Hazard Marks
- ✓ Hazard Labels
- ✓ Placards
- ✓ Shipping Papers
- ✓ Emergency Response
- ✓ Full Training

Common Exceptions

- Limited Quantity/ORM-D
- Excepted Quantity
- Materials of Trade
- Small Lithium Batteries

Outbound Shipping



UN Performance
Packaging



UN1090
Acetone

Hazard Marks



Hazard Class Labels



Placards



Shipping Papers



UN1090
Acetone
1,800 lbs. gross



Outbound Shipping



UN Performance
Packaging



UN1090
Acetone

Hazard Marks



Hazard Class Labels



Placards



Shipping Papers



UN1090
Acetone

400 lbs. gross



Outbound Shipping



UN Performance
Packaging

X



Hazard Marks

X



Hazard Class Labels

X



Placards

X



Shipping Papers

X

**UN1090
Acetone**

6 fl oz.

GROUND



Outbound Shipping



UN Performance
Packaging

X



Hazard Marks



Hazard Class Labels



Placards

X



Shipping Papers



UN1090
Acetone

6 fl oz.

AIR



+ HazMat
Surcharge

Business Turn to Automation

NONE

SOME

COMPLETE



Region	Product	Subsidiary	Year	Sales	Inventory	Revenue	
320	United States	Slipper	New York	24	\$20,709	\$1,001,200	\$8,000
323	United States	Sport Shm	New York	23	\$80,136	\$241,143	\$247
324	United States	Women's C	New York	17	\$175,742	\$425,000	\$4,280
324	United States	Women's B	New York	17	\$558,972	\$1,100,000	\$4,280
326	United States	Shoe	Seattle	16	\$70,793	\$228,429	\$3,389
327	United States	Men's C	Seattle	6	\$86,462	\$114,000	\$1,000
328	United States	Men's D	Seattle	10	\$432,129	\$274,160	\$2,110
329	United States	Sandals	Seattle	16	\$8,208	\$18,780	\$381
330	United States	Slipper	Seattle	16	\$108,265	\$308,000	\$1,217
331	United States	Sport Shm	Seattle	20	\$88,482	\$308,290	\$1,820
332	United States	Women's C	Seattle	2	\$87,260	\$28,000	\$701
333	United States	Women's D	Seattle	21	\$12,446	\$308,227	\$4,217
334	Western Europe	Shoe	Copenhagen	7	\$1,081	\$4,217	\$161
334	Western Europe	Shoe	Copenhagen	7	\$1,081	\$4,217	\$161
335	Western Europe	Men's C	Copenhagen	2	\$12,110	\$48,274	\$461
336	Western Europe	Men's D	Copenhagen	2	\$12,110	\$48,274	\$461
337	Western Europe	Slipper	Copenhagen	1	\$1,507	\$17,883	\$171
338	Western Europe	Sport Shm	Copenhagen	1	\$1,507	\$17,883	\$171
339	Western Europe	Sport Shm	Copenhagen	10	\$18,121	\$37,742	\$4,280

Region	Product	Subsidiary	Year	Sales	Inventory	Revenue	
320	United States	Slipper	New York	24	\$20,709	\$1,001,200	\$8,000
323	United States	Sport Shm	New York	23	\$80,136	\$241,143	\$247
324	United States	Women's C	New York	17	\$175,742	\$425,000	\$4,280
324	United States	Women's B	New York	17	\$558,972	\$1,100,000	\$4,280
326	United States	Shoe	Seattle	16	\$70,793	\$228,429	\$3,389
327	United States	Men's C	Seattle	6	\$86,462	\$114,000	\$1,000
328	United States	Men's D	Seattle	10	\$432,129	\$274,160	\$2,110
329	United States	Sandals	Seattle	16	\$8,208	\$18,780	\$381
330	United States	Slipper	Seattle	16	\$108,265	\$308,000	\$1,217
331	United States	Sport Shm	Seattle	20	\$88,482	\$308,290	\$1,820
332	United States	Women's C	Seattle	2	\$87,260	\$28,000	\$701
333	United States	Women's D	Seattle	21	\$12,446	\$308,227	\$4,217
334	Western Europe	Shoe	Copenhagen	7	\$1,081	\$4,217	\$161
334	Western Europe	Shoe	Copenhagen	7	\$1,081	\$4,217	\$161
335	Western Europe	Men's C	Copenhagen	2	\$12,110	\$48,274	\$461
336	Western Europe	Men's D	Copenhagen	2	\$12,110	\$48,274	\$461
337	Western Europe	Slipper	Copenhagen	1	\$1,507	\$17,883	\$171
338	Western Europe	Sport Shm	Copenhagen	1	\$1,507	\$17,883	\$171
339	Western Europe	Sport Shm	Copenhagen	10	\$18,121	\$37,742	\$4,280

Method: 100% SAFETY DATA SHEET

DANGER

0 01463 7974 15980970 MULT/PCB 10 5
above part is packaged in multiples of 5

0 21138 7892 15050709 CAP 1 34
MULTI

0 30858 1263 15035497 FILLER 1 13

0 35434 2726 15119030 SHPOST 1 28

*** PICK TICKET ***

INV NO: 296555 ROSSIE DEBROUAT OPEN DATE 24/04/04

SOME: A 1275 HWY 36 S OPEN TIME OF: 08:30

POINTER: 133 808 POINT ON: TO: 03237 PRINT DATE 24/04/04

CUSTOM: 2257 SALE TYPE: CASHM PRINT TIME 13:55:08

NO MO: 185 SHIP TO: ROUTE R-D SHIP VIA: DELIVER

SOLD TO: MISH CHEV BUICK 1275 HWY 36 S

SHIP TO: ROUTE R-D

15750785 repl by: SHPOST

15119030 SHPOST

End of Pick Ticket

*** PICK TICKET ***

INV NO: 296555 ROSSIE DEBROUAT OPEN DATE 24/04/04

SOME: A 1275 HWY 36 S OPEN TIME OF: 08:30

POINTER: 133 808 POINT ON: TO: 03237 PRINT DATE 24/04/04

CUSTOM: 2257 SALE TYPE: CASHM PRINT TIME 13:55:08

NO MO: 185 SHIP TO: ROUTE R-D SHIP VIA: DELIVER

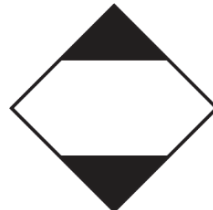
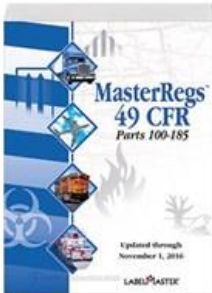
SOLD TO: MISH CHEV BUICK 1275 HWY 36 S

SHIP TO: ROUTE R-D

15750785 repl by: SHPOST

15119030 SHPOST

End of Pick Ticket

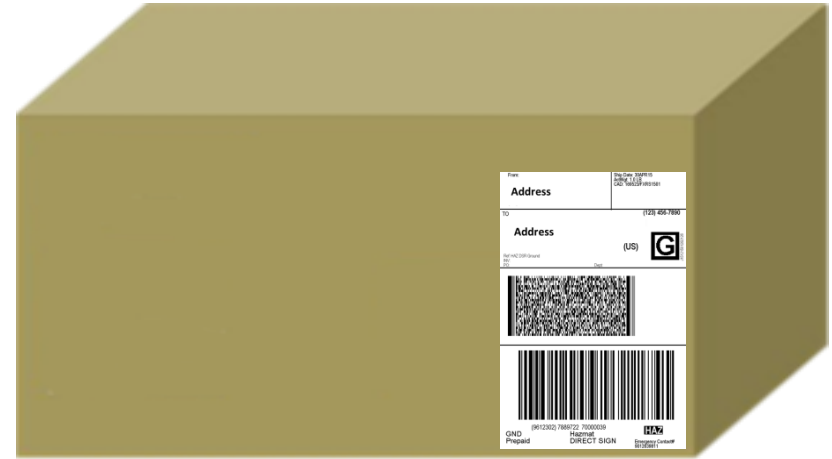


DOT Enforcement



- How **accurate** & **complete** is the dataset?
- Who is writing the automation rules?
- Are the rules updated as regulations change?
- How often is the process audited?

Undeclared Shipment



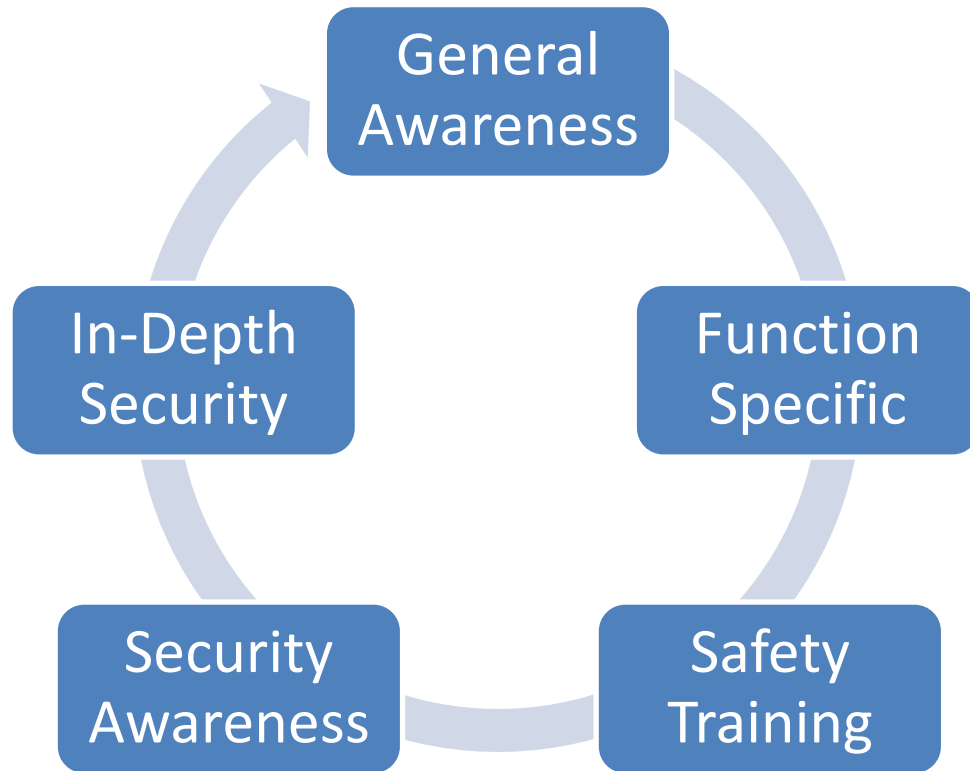
Four (4) spare lithium ion batteries

Top Enforcement Priority for Parcel Shipping:

- ✓ Difficult to discover
- ✓ Mandatory reporting on discovery
- ✓ FAA On-Site Inspections
- ✓ Strict financial penalties

HazMat Transport Training

Parts of a Compliant Training Program



- Employees that ship hazmat must be trained
- DOT training regulations are non-prescriptive
 - No minimum time
 - No instructor qualifications
- Insufficient or lack of training is the most frequent violation cited by DOT inspectors

HazMat Training

- Who needs training?
 - C-level staff?
 - Pick/pack personnel?
 - Outbound shipping area?
 - DC managers?
- What level of training do they need?
 - Week-long multimodal training?
 - Short eLearning modules?
 - On-the-job instruction?

Streamline Training

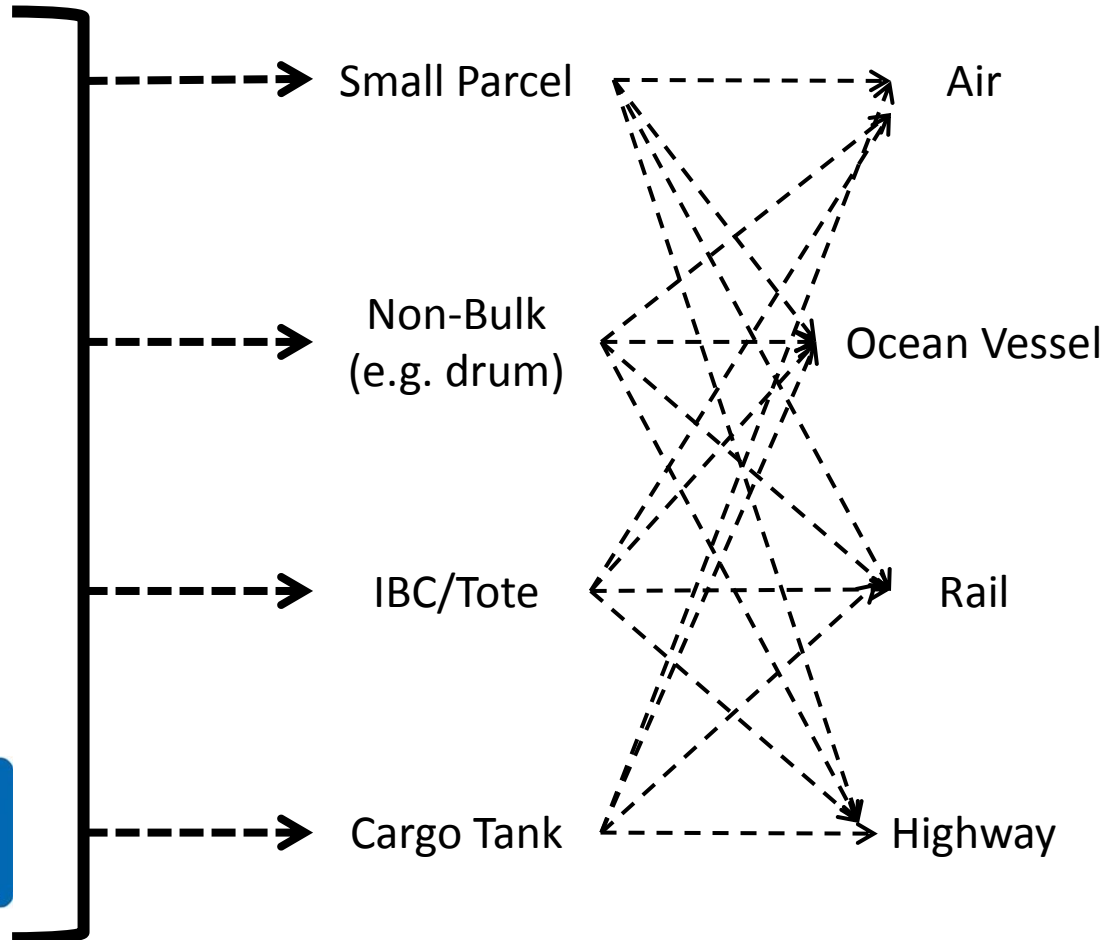
Hazardous Materials

3,700+ UN#s



Quantity

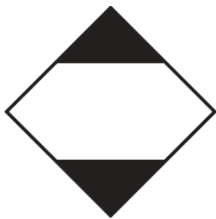
Mode



Streamline Training

Hazardous Materials

3,700+ UN#s



Quantity

Small Parcel

Non-Bulk
(e.g. drum)

IBC/Tote

Cargo Tank

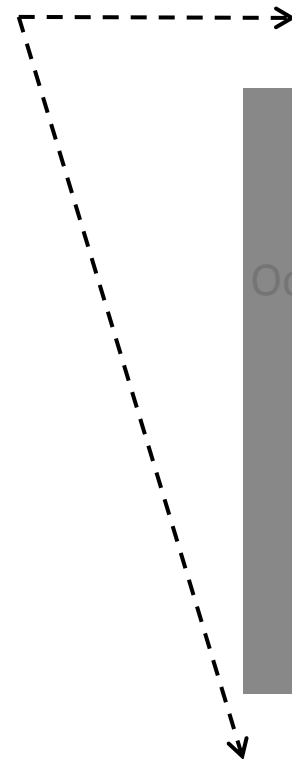
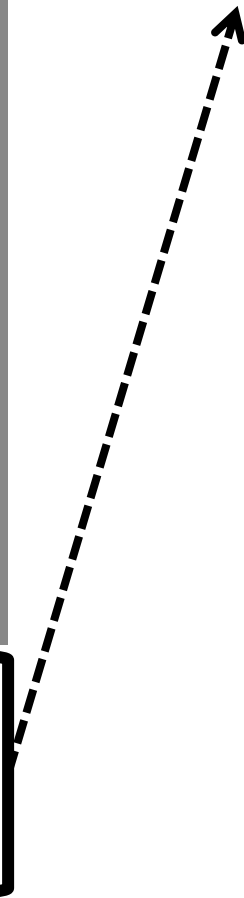
Mode

Air

Ocean Vessel

Rail

Highway



HazMat Shipping Process



```
graph LR; A[Product Classification] --> B[Outbound Shipping]; B --> C[Carrier Acceptance & Transport]; C --> D[Arrival at Destination];
```

Product
Classification

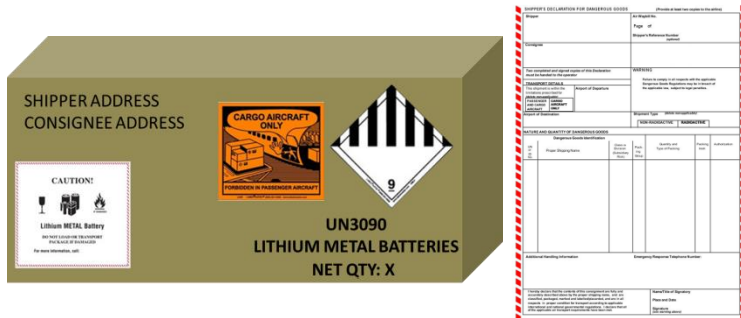
Outbound
Shipping

Carrier
Acceptance
& Transport

Arrival at
Destination

Air Operator Challenges

Acceptance Check and FAA Oversight



- DG shipments subject to 50+ item acceptance checklist
- FAA agents often peeking over their shoulder

DANGEROUS GOODS CHECKLIST FOR A NON-RADIOACTIVE SHIPMENT

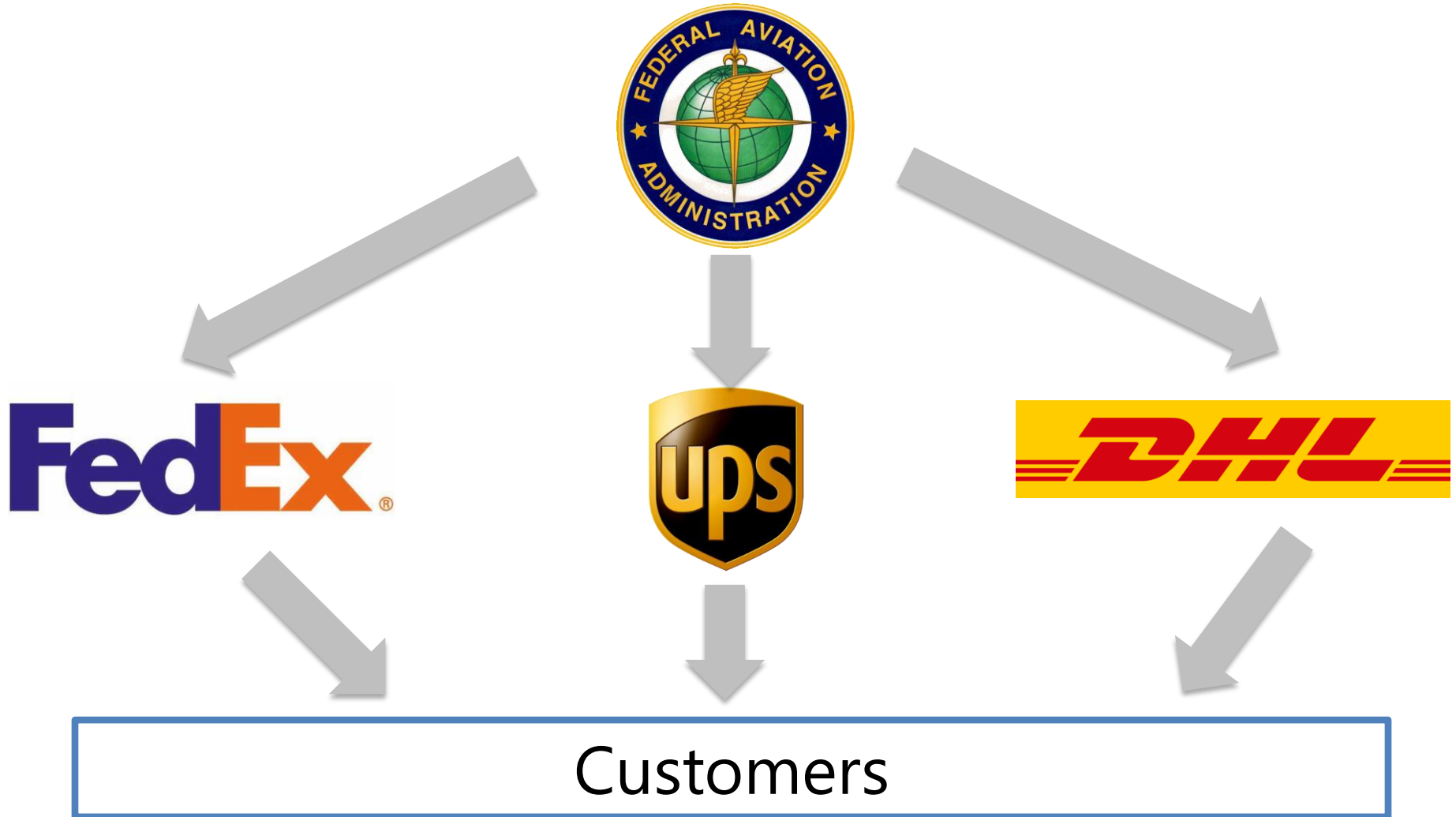
The recommended checklist appearing on the following pages is intended to verify shipments at origin. Never accept or refuse a shipment before all items have been checked.

Is the following information correct for each entry?

SHIPPERS DECLARATION FOR DANGEROUS GOODS (DGD)

	YES	NO*	N/A
1. Two copies in English and in the IATA format including the air certification statement [8.1.1, 8.1.2, 8.1.6.12]	<input type="checkbox"/>	<input type="checkbox"/>	
2. Full name and address of Shipper and Consignee [8.1.6.1, 8.1.6.2]	<input type="checkbox"/>	<input type="checkbox"/>	
3. If the Air Waybill number is not shown, enter it. [8.1.6.3]	<input type="checkbox"/>	<input type="checkbox"/>	
4. The number of pages shown [8.1.6.4]	<input type="checkbox"/>	<input type="checkbox"/>	
5. The non-applicable Aircraft Type deleted or not shown [8.1.6.5]	<input type="checkbox"/>	<input type="checkbox"/>	
6. If full name of Airport or City of Departure or Destination is not shown, enter it. [8.1.6.6 and 8.1.6.7] Information is optional	<input type="checkbox"/>		<input type="checkbox"/>
7. The word "Radioactive" deleted or not shown [8.1.6.8]	<input type="checkbox"/>	<input type="checkbox"/>	
Identification			
8. UN or ID number(s), preceded by prefix [8.1.6.9.1, Step 1]	<input type="checkbox"/>	<input type="checkbox"/>	
9. Proper Shipping Name and the technical name in brackets for asterisked entries [8.1.6.9.1, Step 2]	<input type="checkbox"/>	<input type="checkbox"/>	
10. Class or Division and for Class 1, the Compatibility Group, [8.1.6.9.1, Step 3]	<input type="checkbox"/>	<input type="checkbox"/>	
11. Subsidiary Risk, in parentheses, immediately following Class or Division [8.1.6.9.1, Step 4]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Packing Group [8.1.6.9.1, Step 5]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quantity and Type of Packing			
13. Number and Type of Packages [8.1.6.9.2, Step 6]	<input type="checkbox"/>	<input type="checkbox"/>	
14. Quantity and unit of measure (net, or gross followed by "G", as applicable) within per package limit [8.1.6.9.2, Step 6]	<input type="checkbox"/>	<input type="checkbox"/>	
15. For Class 1, the net quantity supplemented with the net explosive mass followed by unit of measurement [8.1.6.9.2, Step 6]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. When different dangerous goods are packed in one outer packaging, the following rules are complied with:			
- Compatible according to Table 9.3.A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- UN packages containing Division 6.2 [5.0.2.11(c)]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- "All packed in one (type of packaging)" [8.1.6.9.2, Step 6(f)]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Calculation of "Q" value must not exceed 1 [5.0.2.11 (g) & (h); 2.7.5.6; 8.1.6.9.2, Step 6(g)]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Overpack			
- Compatible according to Table 9.3.A. [5.0.1.5.1]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Wording "Overpack Used" [8.1.6.9.2, Step 7]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Air Mode Enforcement



Highway Carrier

Inspection



Placarding Determination



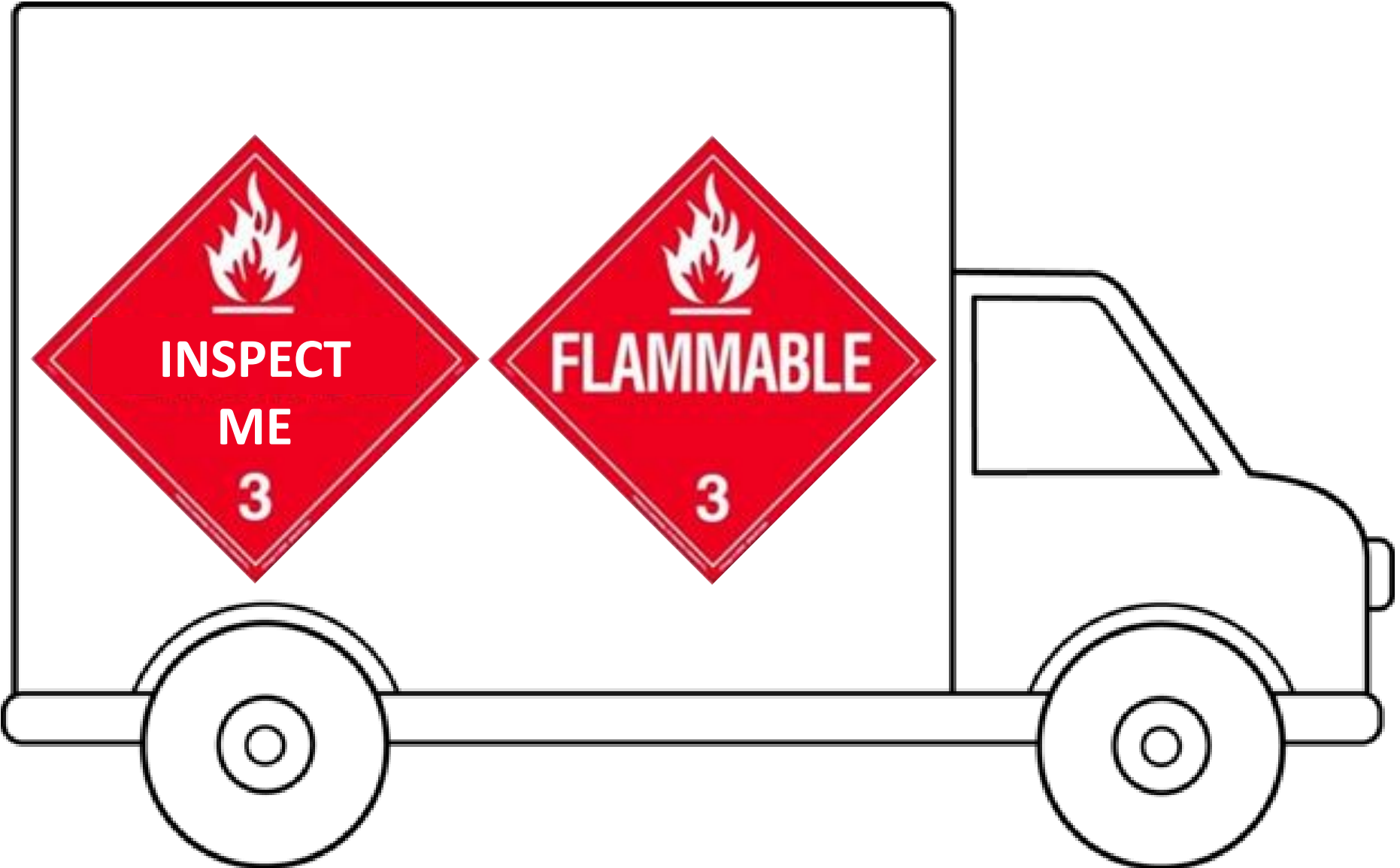
Placards Trigger:

HazMat
Endorsement on CDL

PHMSA Registration

More Enforcement

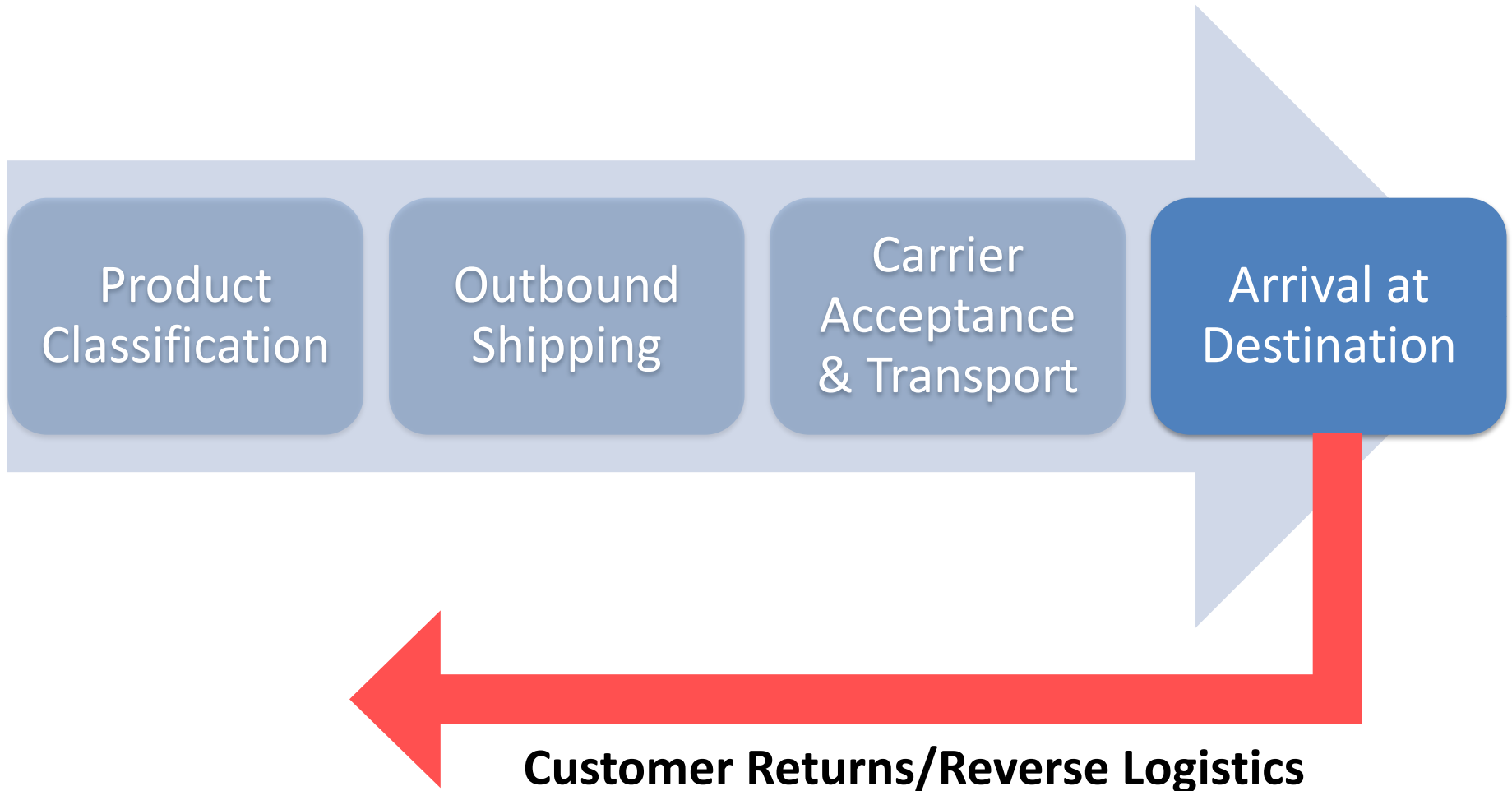
Highway Enforcement



Carrier Challenges

- Quick & correct determination on placarding
- Reliant on the shipper to get things right
- Communicating company policy v. regulation

HazMat Shipping Process



HazMat Regulations are always changing

Most changes are minor, lithium batteries in flux:

- SAE G-27 Lithium Battery Packaging Committee
- On-going Rulemakings (Int'l & Domestic)
- UN Working Group on Lithium Battery Classification

Lithium battery producers & shippers: Now is the time to get involved!

Complexity Breeds Opportunity

Gaining an Advantage:

- Shipper: Adding regulated items to inventory
- Shipper: Quicker fulfillment times through air transport
- 3PL/FF: Broaden customer base to include hazmat
- Carrier: Expanding hazmat willing to transport

DG/HAZMAT SHIPPING RISK MANAGEMENT

There are **1.4 MILLION** U.S. DG shipments per **DAY**¹

Over \$2.3 Trillion
in hazmat goods shipped
across the U.S. annually.²



OVER 2.5 BILLION tons shipped
annually.³

307524
Over 300 Billion Miles Traveled⁴



3,600+
ITEMS

CONSIDERED TO BE DANGEROUS⁵



Mike Pagel
Senior Consultant
Labelmaster Services
mpagel@labelmaster.com