

**William "Randy" Slusher**

**Technical Architect, Cargo Systems Program Directorate**

**Office of Information and Technology**

---

# ACE / WCO Data Model Alignment



7 June 2018, Lima - Peru



U.S. Customs and  
Border Protection

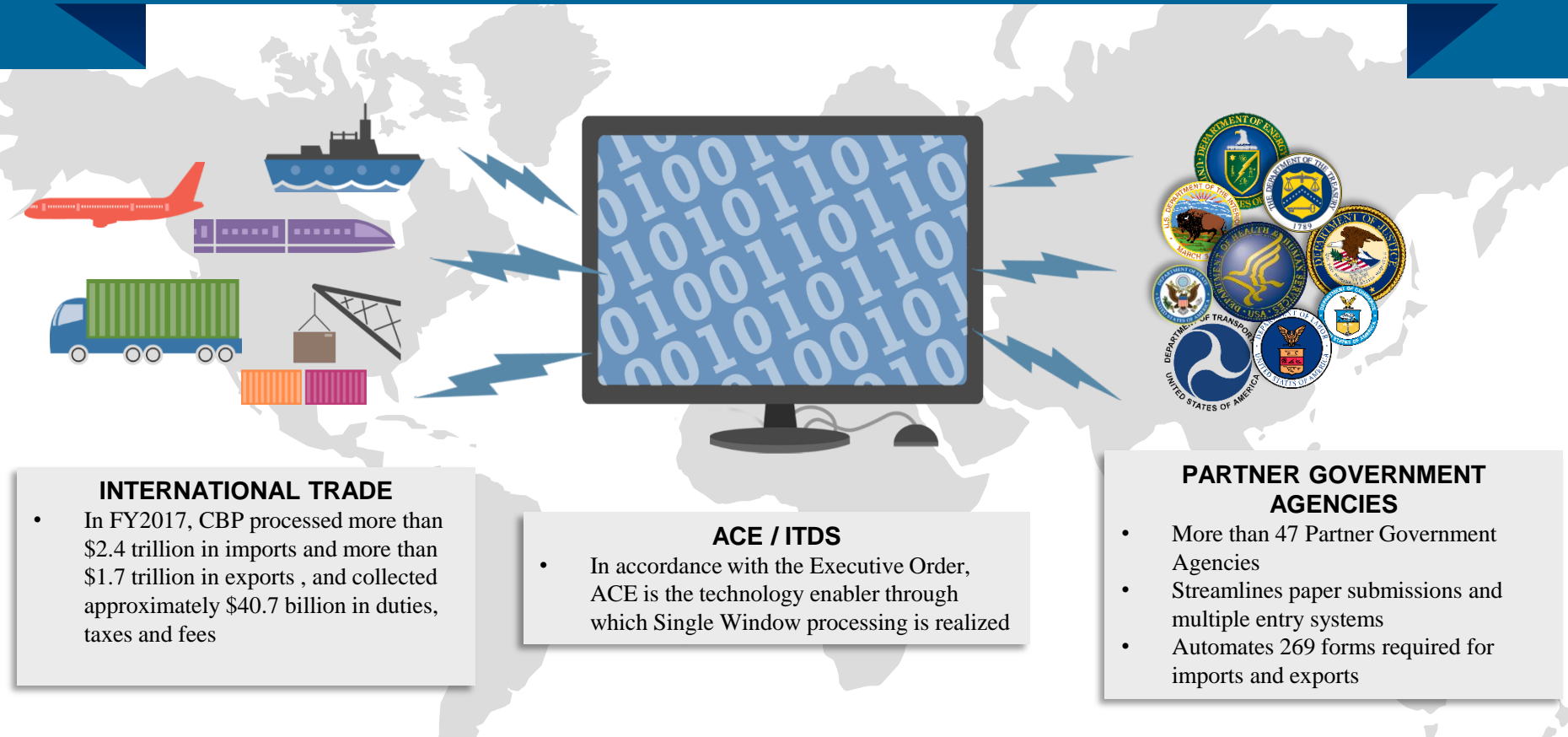
# Agenda

May 2018 WCO DMPT – GEFEG TechTalk

- U.S. Single Window (ACE)
- ACE Trade Data Exchange Landscape
- WCO Data Model Alignment



# U.S. Single Window for Trade



Quicker data availability for government – better identification of dangerous or prohibited shipments



Automated agency interactions reduce paper, enable near-real time decision making by government



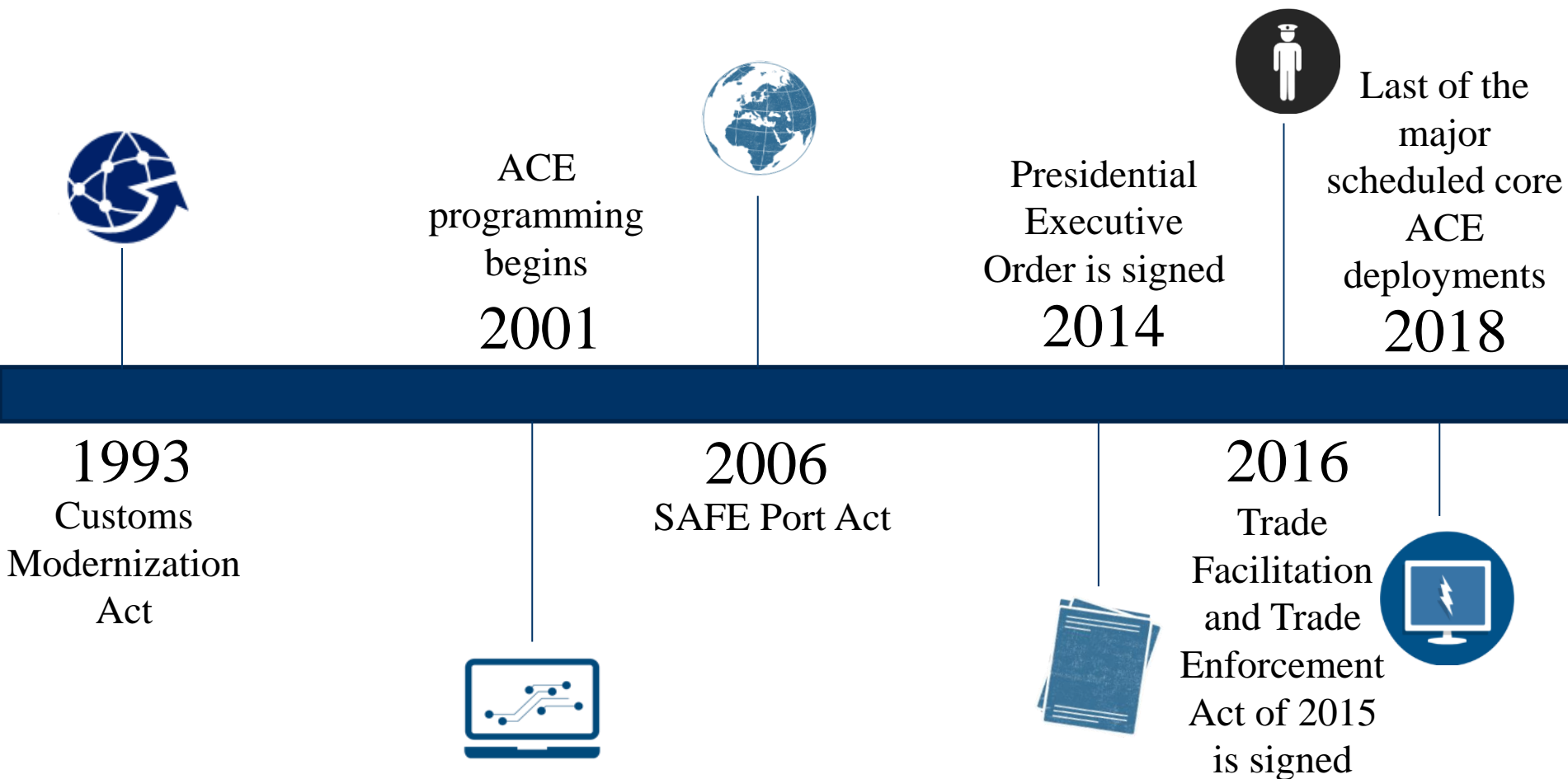
Easier for industry to comply with government regulations



Reduced costs for government and industry

# United States Journey to a Single Window

Throughout implementation, commitment from Government and industry are critical to managing expectations, securing resources, and reinforcing the mission.



# How the Single Window Operates

## How it Works

ACE offers the trade community a simplified process for submitting data and interacting with CBP and Partner Government Agencies (PGAs). The graphic below provides a snapshot of how file and access data in ACE.

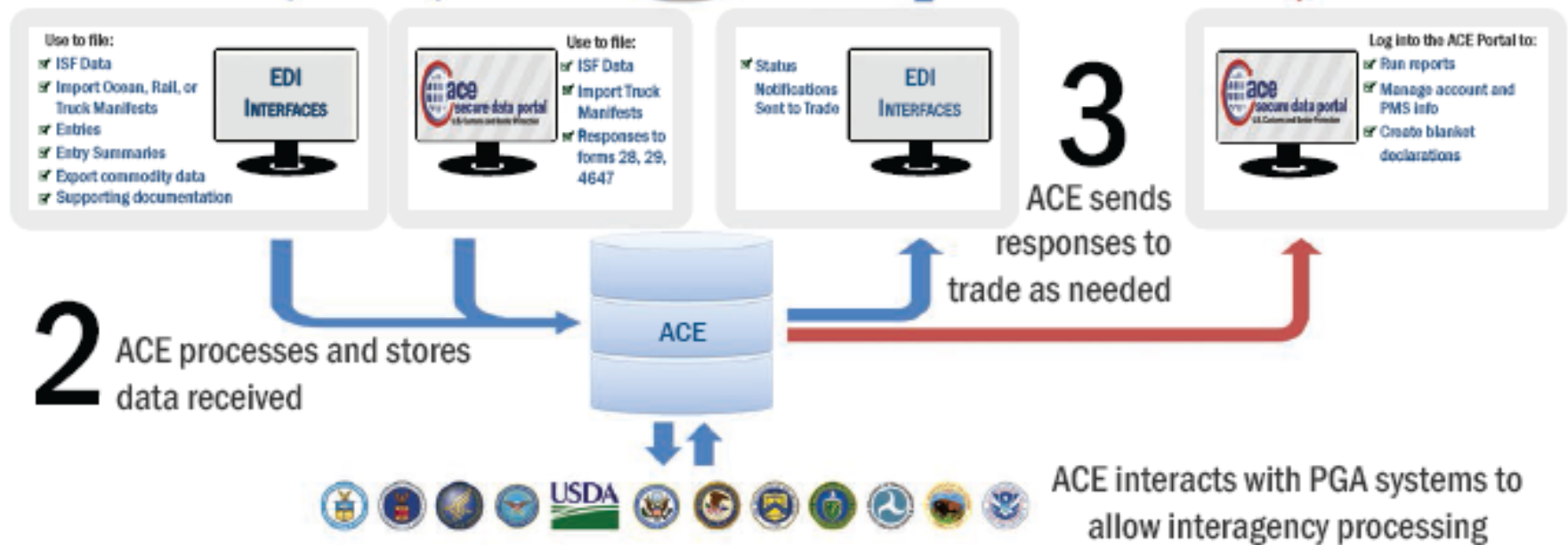
### Transmit

**1** Trade community files data directly to ACE



### View

Use reports to query data in the ACE Portal



# Partner Government Agencies

## 49 Partner Government Agencies in ACE

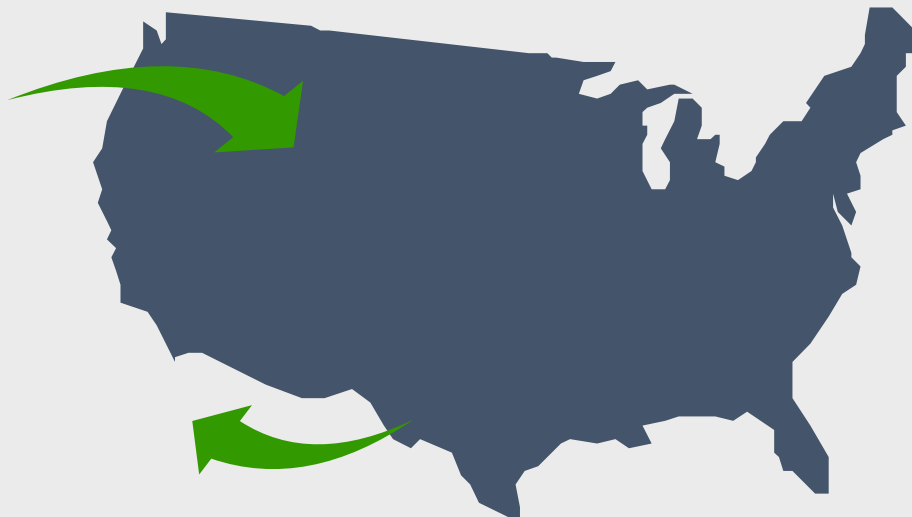
21

21 agencies have data requirements at time of import or export and collect data from trade in ACE via the PGA message set or DIS



28

28 Agencies have no data requirements at time of import or export, but view data via the ACE Portal



resulting in **250+** paper forms automated

Details available at  
[www.cbp.gov/ace-pga](http://www.cbp.gov/ace-pga)

PGA Status

PGA Import Forms List

PGA Export Forms List

# ACE Sustainment and Enhancements

CBP is focused on sustaining all deployed ACE capabilities and ensuring ACE operates as a highly available, reliable system.



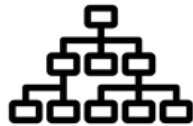
Timely  
system bug  
fixes



Program  
management



Software  
sustainment



Infrastructure  
support

CBP will continue to collaborate with stakeholders to implement enabling automated solutions that advance mission objectives for trade facilitation, enforcement and security.



# ACE Trade Data Exchange Landscape





# High-Level US Import Process

## Pre-Arrival

**Cargo Declaration**  
(Timing requirements based on mode of transport and type of cargo.)

**Stow Plan / Consist**  
(Ocean / Rail modes of transport)

**Advanced Electronic Information**  
(ISF / ACAS - Timing requirements based on mode of transport and type of cargo.)

## Arrival / Cargo Release

**Cargo Release / Entry**  
(Within 15 Calendar Days of Shipment Arrival at US Port.)

**Conveyance Departure / En-route**  
(Timing requirements based on mode of transport and type of cargo.)

**Arrival**

## Post Release

**Entry Summary**  
(Required within 10 days of Cargo Release)

**Conditional Release Period**  
(30 days)

**Duties, Taxes & Fees Payment**  
(Required within 10 days of Entry Summary)

**Liquidation**  
(314 days to 1 year)

**If Payment on Monthly Statement**  
(45 days)

**Protest Deadline**  
(180 days after Liquidation Date)

**Statute of Limitations**  
(7 years)

## Revenue

**Collections – Estimated Duties, Taxes, & User Fees**

- Collections are made throughout the import process based on the type of revenue. For example, the payment of some fees is required at arrival while others are collected on a regular schedule; monthly, quarterly, semi-annually, or annually.



U.S. Customs and  
Border Protection



# ACE Trade Data Exchange Landscape

- ACE supports processing of:
  - 20 + Electronic Data Interchange (EDI) message formats.
  - 10,000+ Trade participants set up for EDI.
  - 140+ unique types of incoming EDI messages.
  - 180+ unique types of outgoing EDI messages.
- Average EDI processing volumes:
  - Daily: Over 1.6 million in & 6.1 million out.
  - Yearly: Over 600 million in & 2.2 billion out.



# US CBP EDI Message Formats

System	Subsystem	Transport Mode / Goods Declaration	Trade Data Exchange Standard
ACE	Import Manifest	Air	Air CAMIR
		Ocean	Ocean CAMIR, ANSI-X12 (v4010), ANSI-X12 (v5040 ISF), UN/EDIFACT BAPLIE (vSMDG 1.5, 2.0.7, & 2.1.1), UN/EDIFACT WCOCAR (CSI BOL Download Only), Container Status Messages: ANSI X.12 322 (v4010/5010), ANSI X.12 315 (v4010/5010), UN/EDIFACT CODECO, & UN/EDIFACT COARRI
		Rail	ANSI X.12 (v4040)
		Truck	ANSI-X12 (v4060), UN/EDIFACT (v03B Standard), UN/EDIFACT (v00B Preferred, FAST/NCAP)
	In-Bond, Cargo Release, & Entry Summary	In-Bond, Cargo Release, Entry Summary, & Other Post Release Functions	ACE CATAIR
	Document Management System (DIS)	All	XML (DIS - Document Imaging System)
	Export Manifest	Air	AIR CAMIR, IATA Cargo-IMP (32nd Edition)
		Ocean	ANSI-X12 (v6050), CAMIR
		Rail	To Be - ANSI-X12 (v7010)
		Truck	TBD
		Commodity	AESTIR
ACS (Legacy)	Remaining Post Release Processes	Other Post Release Functions	ACS CATAIR



# EDI Message Formats by Trade Participant

EDI Message Format	Version	Trade Participant	Quantity (Est.)
Ocean CAMIR	N/A	Carrier	3,171
		Facility	184
		Additional Notify Party	18
Ocean X12	4010	Carrier	1,357
		Facility	10
		Additional Notify Party	22
	5010	Carrier	1,357
	5040	Carrier	10
Ocean EDIFACT	(v6050) export	Carrier	1,357
	(vSMDG 1.5, 2.0.7, & 2.1.1)	Carrier (MVOCCs)	2,979
	(D:00B:UN)	Carrier	2,979
Ocean CSV	(D:01C:CC)	Additional Notify Party	0
	N/A	Carrier	1
Air CAMIR	N/A	Carrier	270
		Forwarder	24
		Facility	524
Air IATA Cargo-IMP	N/A export	Carrier	1
Rail X12	4040	Carrier	21
	(v7010) export	Carrier	21
Rail Railinc	H	Carrier	21
Truck X12	4060	Carrier	1,340
Truck EDIFACT	(v03B Standard)	Carrier	596
	(v00B Preferred, FAST/NCAP)	Carrier	3
ACE CATAIR	N/A	Broker	4,786
	N/A	Surety	17
DIS XML	N/A	All	638
AESTIR-C	N/A	Forwarder	443
AES-C X12	N/A	Forwarder	120



# EDI Implementation Guides Available to Trade

<https://www.cbp.gov/trade/automated/technical>

Trade

Basic Import and Export

ACE and Automated Systems

Getting Started with Automated Systems

Technical Documentation

Automated Commercial System/Broker Interface

Automated Export System

ACE Features

ACE Federal Register Notices

Border Interagency Executive Council

Programs and Administration

Priority Trade Issues

Rulings and Legal Decisions

Stakeholder Engagement

Trade Facilitation and Trade Enforcement Act

## Technical Documentation for All CBP Automated Systems

These pages linked below provide the message formats and technical specifications necessary to electronically transmit data to CBP's automated systems, along with scheduled system outages that affect testing of software.

### ACE Technical Documentation

Import Manifest	<ul style="list-style-type: none"><li>• <a href="#">ACE Import Manifest Documentation</a></li></ul>
Entry / Entry Summary	<ul style="list-style-type: none"><li>• <a href="#">ACE Customs and Trade Automated Interface Requirements (CATAIR)</a></li></ul>
Exports	<ul style="list-style-type: none"><li>• <a href="#">AESDirect Technical Information</a></li><li>• <a href="#">Commodity Filing (Automated Export System (AES) capabilities are now part of the ACE system)</a></li><li>• <a href="#">Manifest Filing</a></li></ul>

### Legacy System Documentation

These links contain detailed requirements for filing information to legacy systems including ACS ABI CATAIR technical requirements.

Entry / Entry Summary	<ul style="list-style-type: none"><li>• <a href="#">ACS Customs and Trade Automated Interface Requirements (CATAIR)</a></li></ul>
-----------------------	---

### ACE Outage Schedules

There are two ACE environments available to the trade – Certification (CERT) and Production.


- The production environment is the day-to-day live ACE environment used to process import and export submissions.
- The certification environment is for trade users to test ACE capabilities prior to filing in the production environment.

## ACE Approved Software Vendors and Service Providers


A complete list of approved companies who have developed software applications or provide filing services for ACE are provided below. Inclusions on this list do not constitute any form of endorsement by CBP.

- [ACE Software Vendors](#)
- [Truck Software Developers](#)
- [Air Manifest Vendors & Software Developers](#)
- [Ocean Data Processing Services](#)
- [Export Vendors and Service Centers](#)


## Get Started with ACE



Get Started



Apply for an Account



Login

## How to Stay Informed

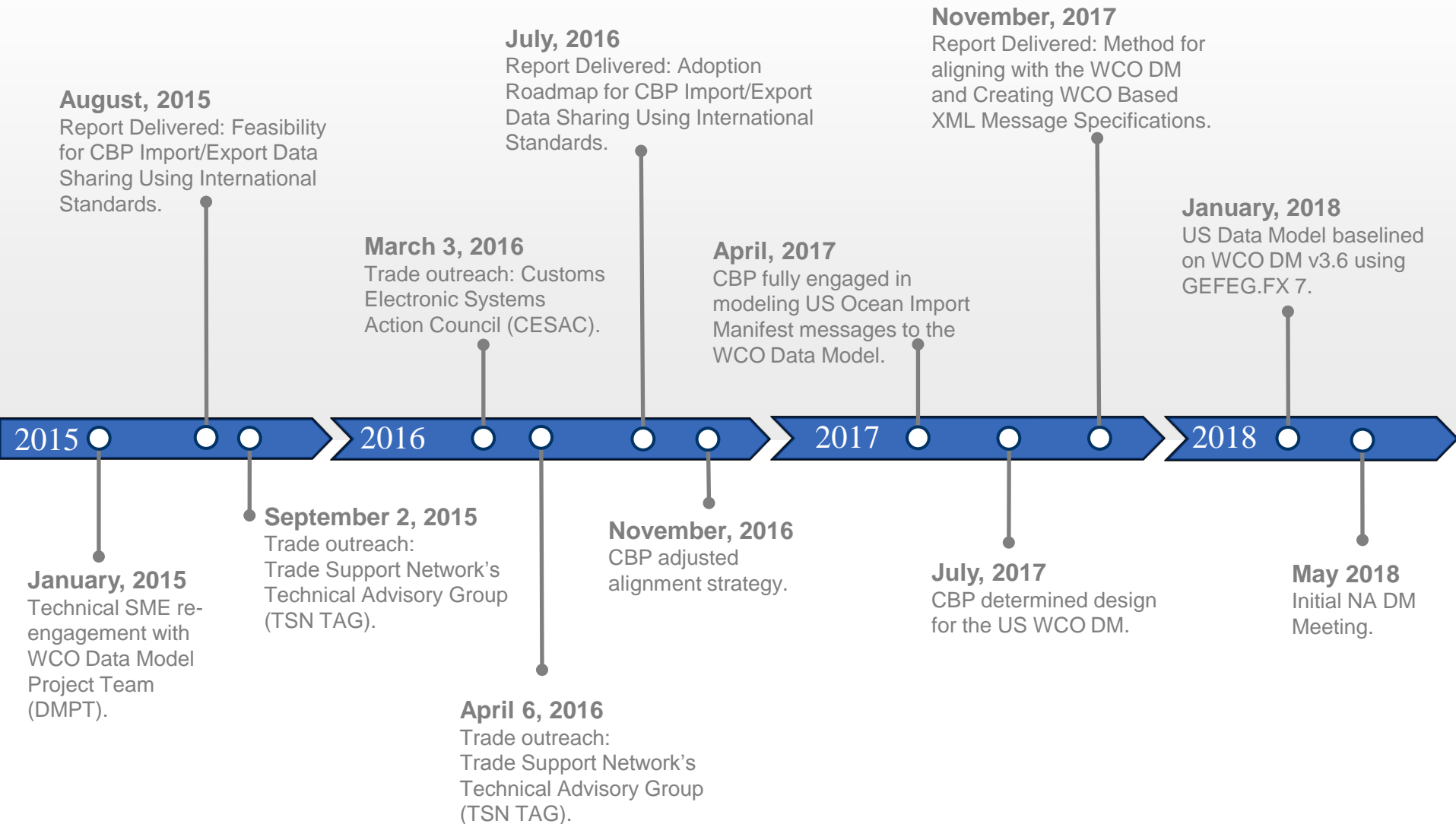
# WCO Data Model Alignment



# WCO Data Model (DM) Alignment Benefits

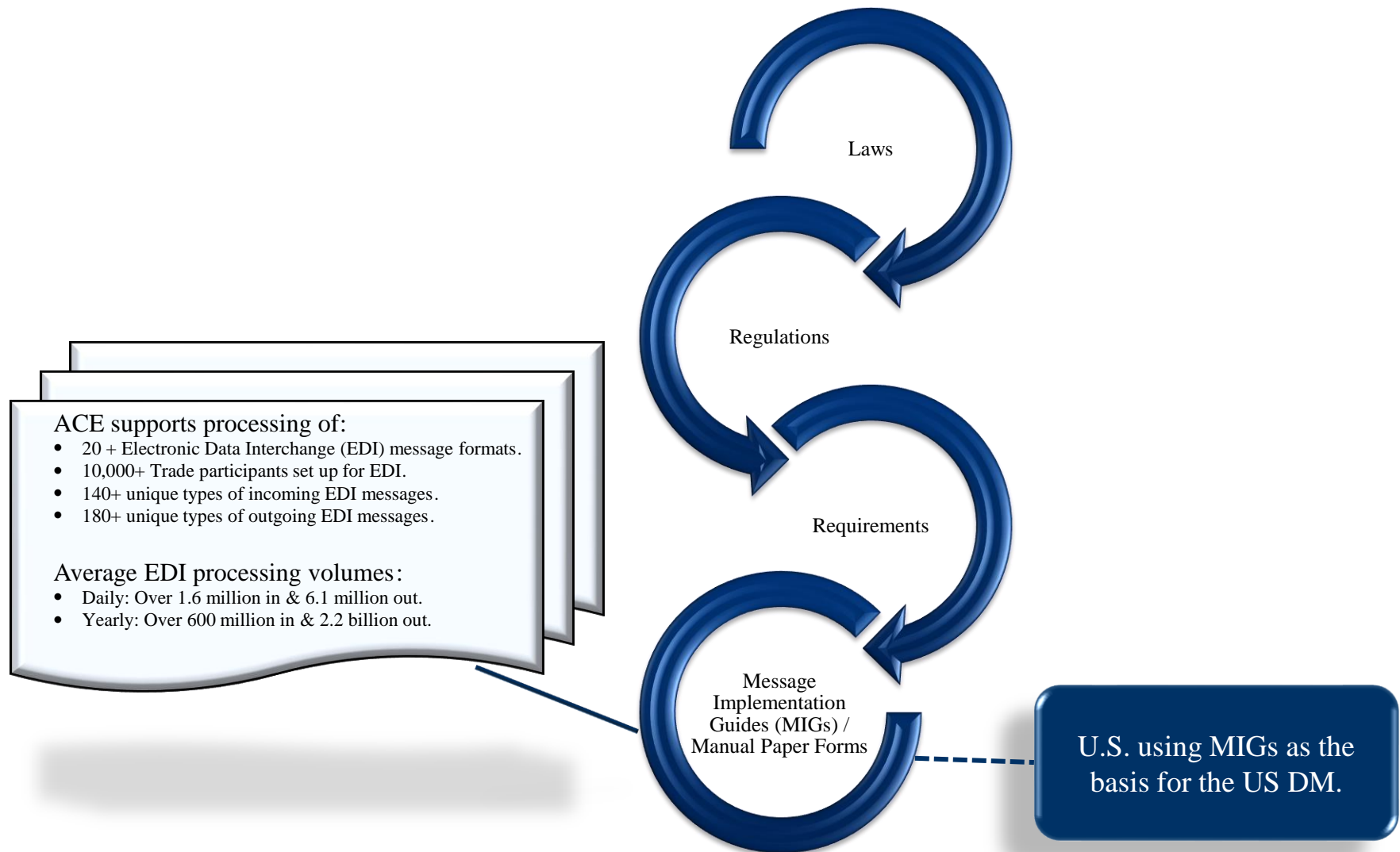
- Reduces resource and financial burden on CBP and the trade community.
- Improves data quality by the use of common vocabulary, definitions, representations, and standard international codes.
- Facilitates data alignment with other Customs Authorities data models.
- Ensures ongoing compliance with international data standards.

# Alignment Efforts





# Basis for Systems & Data Interchange



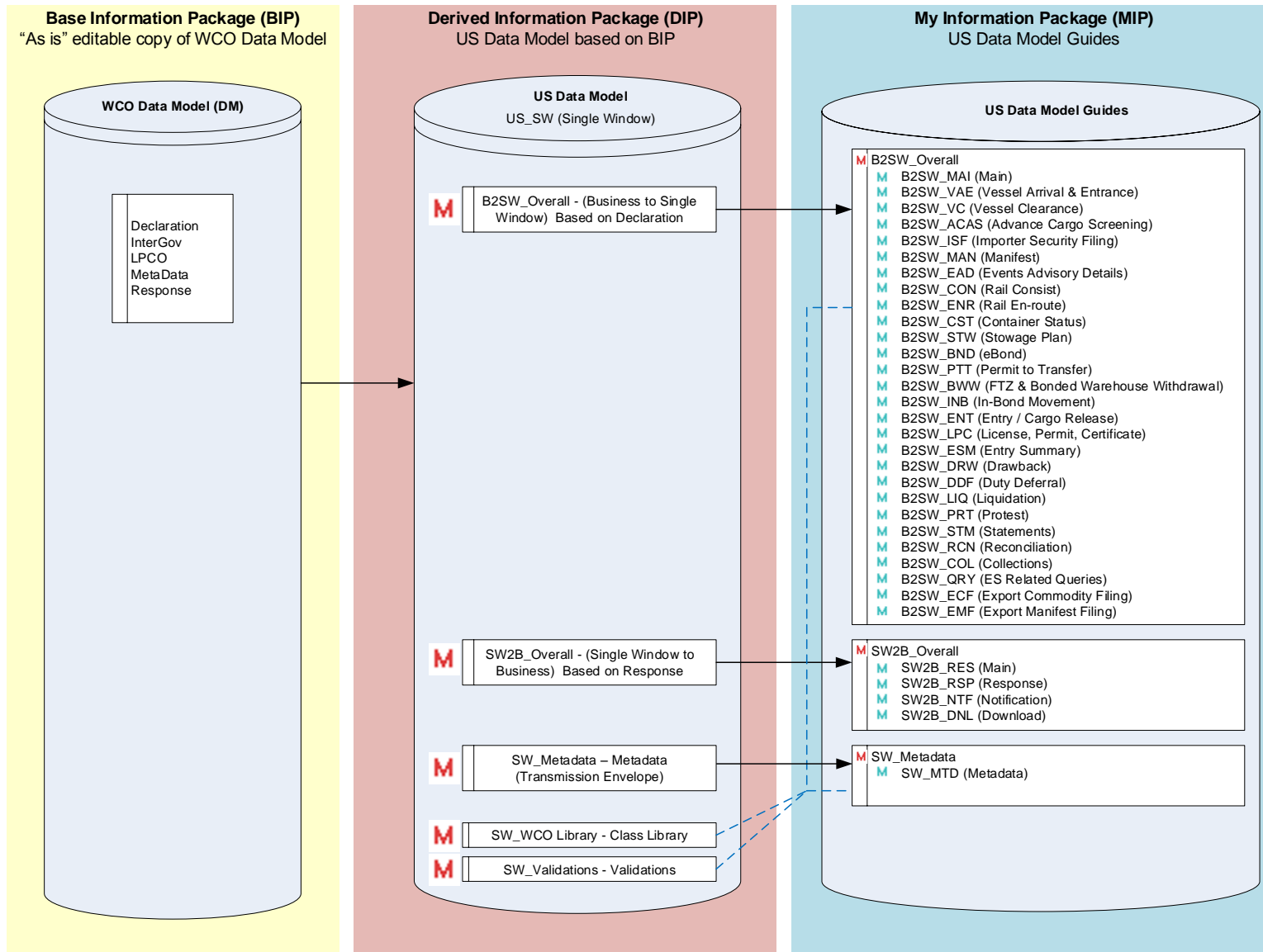
# High-level Process for Creating US DM

- Download “As is” editable version of the WCO DM.
  - *Base Information Package (BIP)* : US\_SW.
- Create US DM from the BIP.
  - *Derived Information Package (DIP)* : B2SW\_Overall, SW2B\_Overall, SW\_MetaData, SW\_WCO Library, SW\_Validations.
- Create US Data Model Guides.
  - *My Information Packages (MIPs)* : B2SW\_MAI, B2SW\_MAN, B2SW\_EAD, B2SW\_INB, B2SW\_PTT, SW2B\_RES, SW2B\_RSP, SW2B\_NTF, SW\_MTD.
- Map to the US DM.
  - Download “As-Delivered” Version of SDO-issued EDI Standard (if applicable).
  - Create U.S. EDI Standards & U.S. EDI Guides (CBP Proprietary).
  - Map US EDI Guides to the US DM Guides.
- Modify U.S. DM based on U.S. EDI requirements.
- Identify Required Modifications to WCO Data Model.
  - Present Data Maintenance Requests (DMRs) to WCO DMPT.
- Generate Publication Project / MIGs. (XMLs, UMLs, XSDs, Reports, etc.)

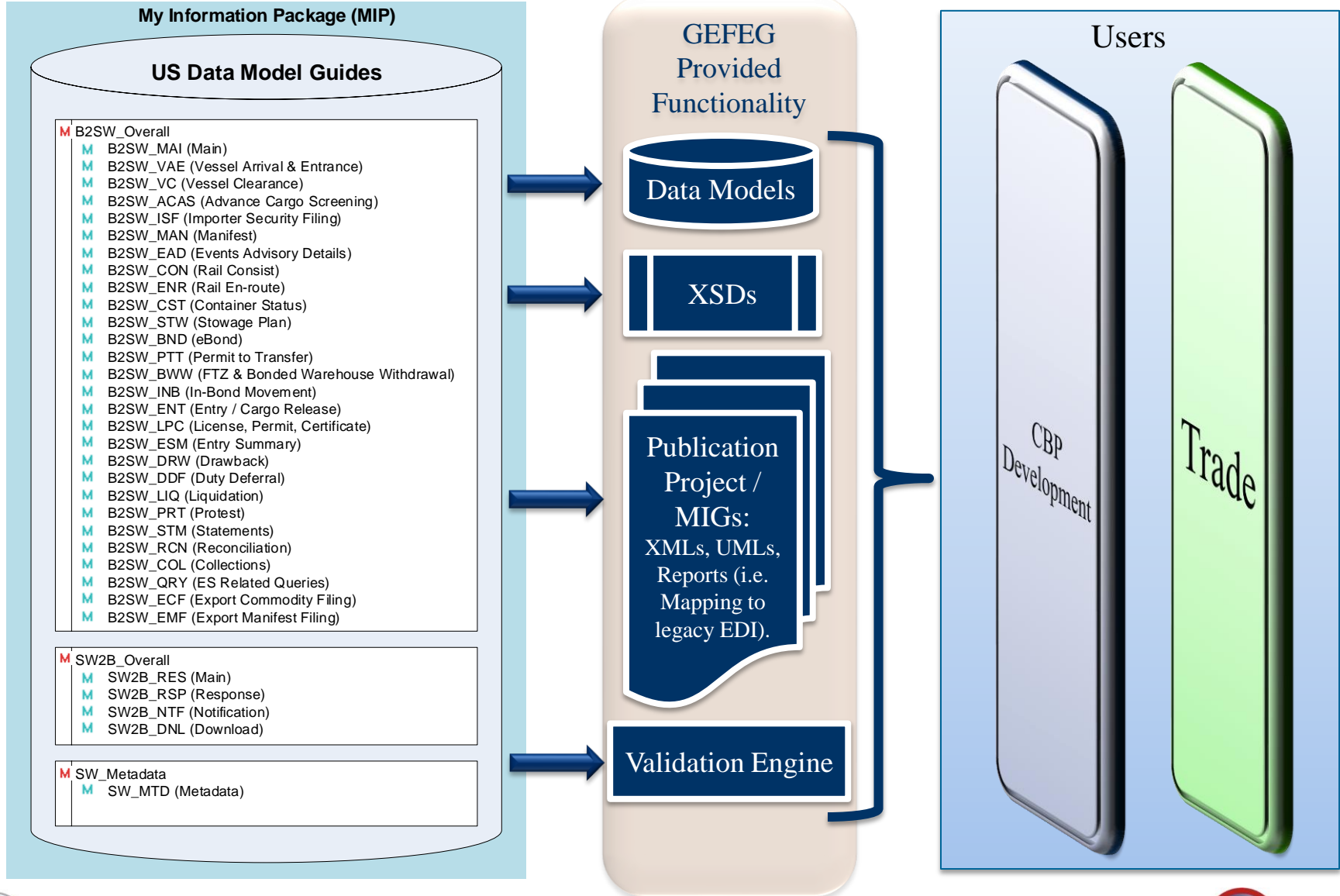


Repeat  
Process









# US Data Model Structure



# US Data Model Outputs



# Generated Report Example

Name	Date modified	Type	Size
 B2SW_EAD_X12 Mapping Report.rtf	11/28/2017 11:20 ...	Rich Text Format	82 KB
 B2SW_INB_X12 Mapping Report.rtf	11/28/2017 11:20 ...	Rich Text Format	102 KB
 B2SW_MAI_X12 Mapping Report.rtf	11/28/2017 11:20 ...	Rich Text Format	34 KB
 B2SW_MAN_US_Classes&Attributes.rtf	11/28/2017 11:22 ...	Rich Text Format	502 KB
 B2SW_MAN_X12 Mapping Report.rtf	11/28/2017 11:19 ...	Rich Text Format	330 KB
 B2SW_PTT_X12 Mapping Report.rtf	11/28/2017 11:21 ...	Rich Text Format	52 KB
 SW_MetaData_US_Classes&Attributes.rtf	11/28/2017 12:29 ...	Rich Text Format	12 KB
 US_SW_Validations.rtf	11/28/2017 12:22 ...	Rich Text Format	73 KB

## Mapping

Model: B2SW\_MAN  
Root Element: **Declaration**

Standard: US X12 004010  
Guide: **X12 Ocean 309**

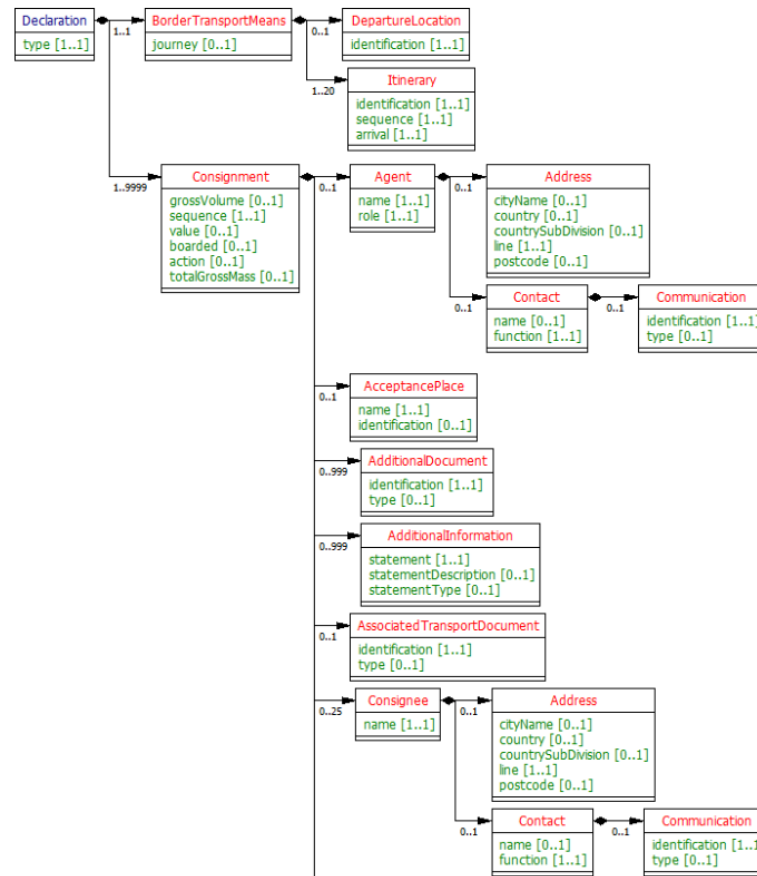
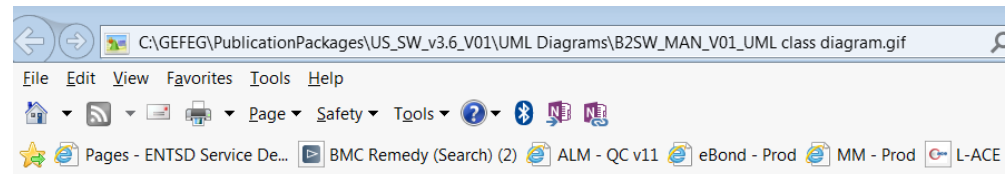
No	Element	Length	Occurrence	SeN	Rec Id	Field	Name	Pos	Size	St	F
024	<i>099</i> <i>an..3</i> <b>issuingParty</b> Path: Declaration/Consignment/TransportContractDocument/issuingParty <i>an..17</i> <i>International codes (e.g. DUNS, EAN) or user codes</i> <i>Transport document issuing party, coded</i> <i>D022</i>	..	1..1	6	M13	140	Standard Carrier Alpha Code	0023	4 M	ID	2/4
025	<b>identification</b> Path: Declaration/Consignment/TransportContractDocument/identification <i>an..70</i> <i>Transport document number</i> <i>D023</i>	..	1..1	7	M11	598	Bill of Lading/Waybill Number	0005	12 M	AN	1/
026	<b>identification</b> Path: Declaration/Consignment/LoadingLocation/identification <i>an..17</i> <i>Place of loading, coded</i> <i>L010</i> <i>UN/LOCODE (an..5) + user codes (an..12)</i>	..	1..1	7	M11	310	Location Identifier	0007	30 M	AN	1/
027	<b>boarded</b> Path: Declaration/Consignment/boarded <i>Boarded Quantity</i> <i>314</i> <i>n..16</i>	..	0..1	7	M11	380	Quantity	0009	15 M	R	1/1



# Generated UML Example

Name

- B2SW\_EAD\_V01\_UML class diagram.gif
- B2SW\_INB\_V01\_UML class diagram.gif
- B2SW\_MAI\_V01\_UML class diagram.gif
- B2SW\_MAN\_V01\_UML class diagram.gif**
- B2SW\_Overall\_V01\_UML class diagram.gif
- B2SW\_PTT\_V01\_UML class diagram.gif
- SW\_MTD\_V01\_UML class diagram.gif
- SW2B\_NTF\_V01\_UML class diagram.gif
- SW2B\_Overall\_V01\_UML class diagram.gif



# Generated XSD Example

Name	Date modified	Type
B2SW_EAD.xsd	11/28/2017 1:25 PM	XSD File
B2SW_EAD_DS.xsd	11/28/2017 1:25 PM	XSD File
B2SW_INB.xsd	11/28/2017 11:52 ...	XSD File
B2SW_INB_DS.xsd	11/28/2017 11:52 ...	XSD File
B2SW_MAI.xsd	11/28/2017 10:18 ...	XSD File
B2SW_MAI_DS.xsd	11/28/2017 10:18 ...	XSD File
B2SW_MAN.xsd	11/28/2017 11:24 ...	XSD File
B2SW_MAN_DS.xsd	11/28/2017 11:24 ...	XSD File
IANA_CharacterSetCode_2013-01-08 (3)....	11/28/2017 1:19 PM	XSD File
IANA_CharacterSetCode_2013-01-08 (4)....	11/28/2017 4:09 PM	XSD File

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns="urn:wco:datamodel:WCO:Declaration:1"
  xmlns:ds="urn:wco:datamodel:WCO:Declaration_DS:1"
  targetNamespace="urn:wco:datamodel:WCO:Declaration:1"
  elementFormDefault="qualified">
  <xs:import namespace="urn:wco:datamodel:WCO:Declaration_DS:1" schemaLocation="
  <xs:element name="Declaration">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="TypeCode" type="ds:DeclarationTypeCodeType" minOccurs=
        <xs:element name="BorderTransportMeans" minOccurs="1" maxOccurs="1">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="JourneyID" type="ds:BorderTransportMeansJourneyID"
              <xs:element name="DepartureLocation" minOccurs="0">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="ID" type="ds:DepartureLocationIdentification"
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
              <xs:element name="Itinerary" minOccurs="1" maxOccurs="20">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="ID" type="ds:ItineraryIdentificationIDType"
                    <xs:element name="SequenceNumeric" type="ds:ItinerarySequence"
                    <xs:element name="ArrivalDateTime" type="ds:ItineraryArrival"
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="Consignment" minOccurs="1" maxOccurs="9999">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="GrossVolumeMeasure" type="ds:ConsignmentGrossVol"
              <xs:element name="SequenceNumeric" type="ds:ConsignmentSequenceNum"
              <xs:element name="ValueAmount" type="ds:ConsignmentValueAmountType"
              <xs:element name="BoardedQuantity" type="ds:ConsignmentBoardedQuan"
              <xs:element name="ActionCode" type="ds:ConsignmentActionCodeType" ;
```

e Markup Language file



# Tangible Benefits of WCO DM & GEFEG

- Potential for one EDI format reducing cost.
- Reduction of costs for development, publication, and maintenance of MIGs with the use of GEFEG.
- Generation of MIGs from the DM.
- Reporting Capabilities.
  - Legacy MIG to DM Mappings.
  - Complete Data Element to DM Guide Mapping.
- Collaborative environment.
  - Provide specific access to functional teams to control their data sets.
  - Potential to provide limited access to PGAs for only their data.
- Easier data alignment with other Customs Authorities' data models & MIGs.





# Next Steps

- On-going participation in WCO DMPT meetings.
- Continue mapping & modeling:
  - Finalize Ocean Import Manifest.
  - Import Manifest for other three MOTs; Air, Rail, & Truck.
- Vet DMRs and submit to WCO DMPT as needed.
- Coordinate with other customs administrations / DMPT members.
- Explore regional data model potential based on the WCO DM.



# Lessons Learned

- Regular participation in WCO DMPT meetings is essential.
- DMPT members are very approachable & willing to share knowledge.
  - Ask questions! 😊
- DMRs should be vetted in advance through the DMPT community.
- The WCO DM and GEFEG enhance regional DM possibilities.



# QUESTIONS?

