



**THE  
OPIOID  
DETECTION  
CHALLENGE**

# Informational Webinar

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March 11, 2019

# Introductions

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Border Protection**



**United States Postal  
Inspection Service**



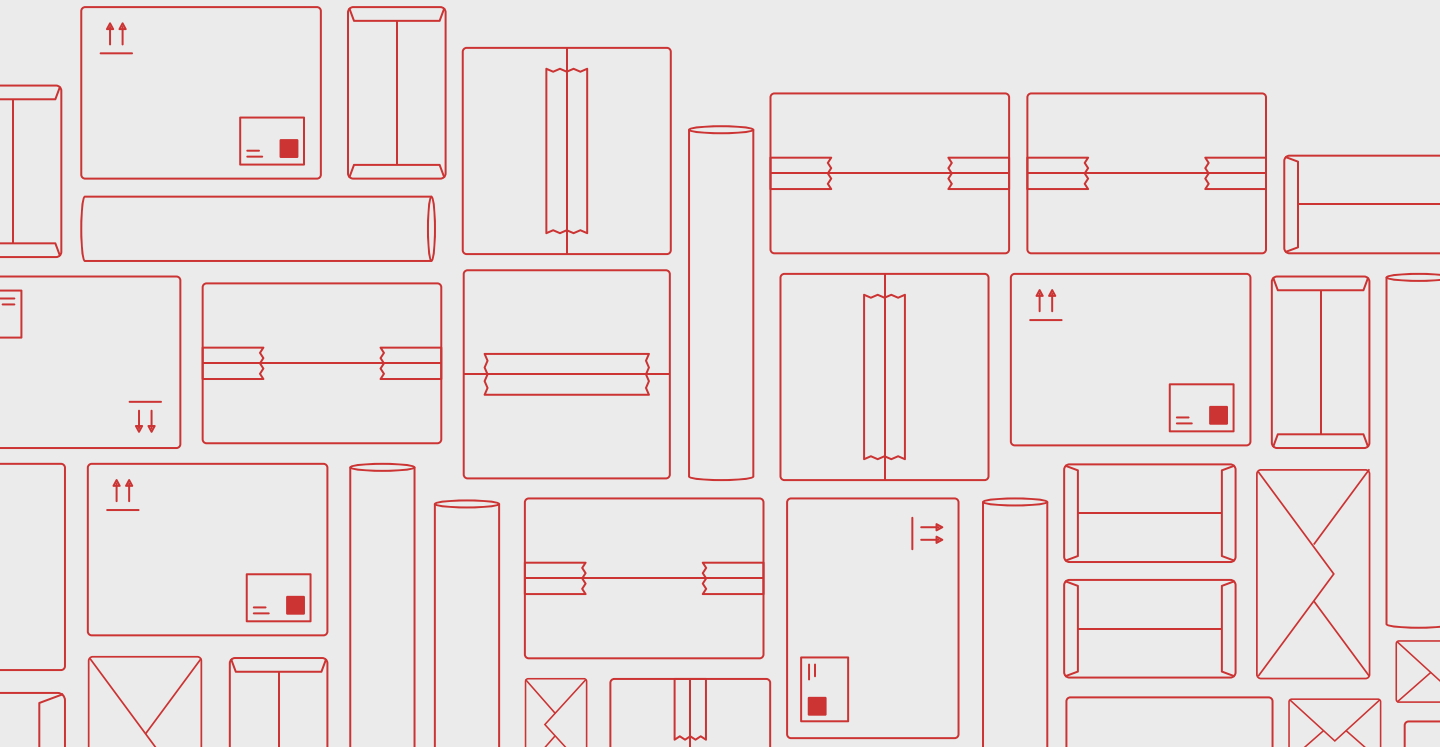
**Office of National  
Drug Control Policy**

# Agenda

- 1 Challenge Overview
- 2 Detecting Opioids in International Mail
- 3 Submitting a Solution to the Challenge
- 4 Q&A

This presentation is intended for informational purposes only. All information presented here is superseded by the Rules, Terms and Conditions page on the Challenge website.

# CHALLENGE OVERVIEW



# Why are we holding this challenge?

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The opioid crisis is an unprecedented public health crisis.

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International mail is one channel by which illicit opioids enter the United States.

# Seeking solutions to detect opioids

## Call to Action

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The United States government calls upon innovators to submit novel plans for rapid, nonintrusive detection tools that will help find illicit opioids in international mail.

# Challenge Timeline



## **Challenge Launch**

February 27 2019

## **Stage 1 Submission Deadline**

April 24 2019

## **Stage 1 Finalists Announced**

Spring 2019

## **Stage 2 Prototyping Accelerator**

Summer 2019

## **Stage 2 Live Test Event**

Summer 2019

## **Stage 2 Winners Announced**

Fall 2019

# Awards

TOTAL PRIZE POOL

# \$1.55 million

Stage 1: \$800,000

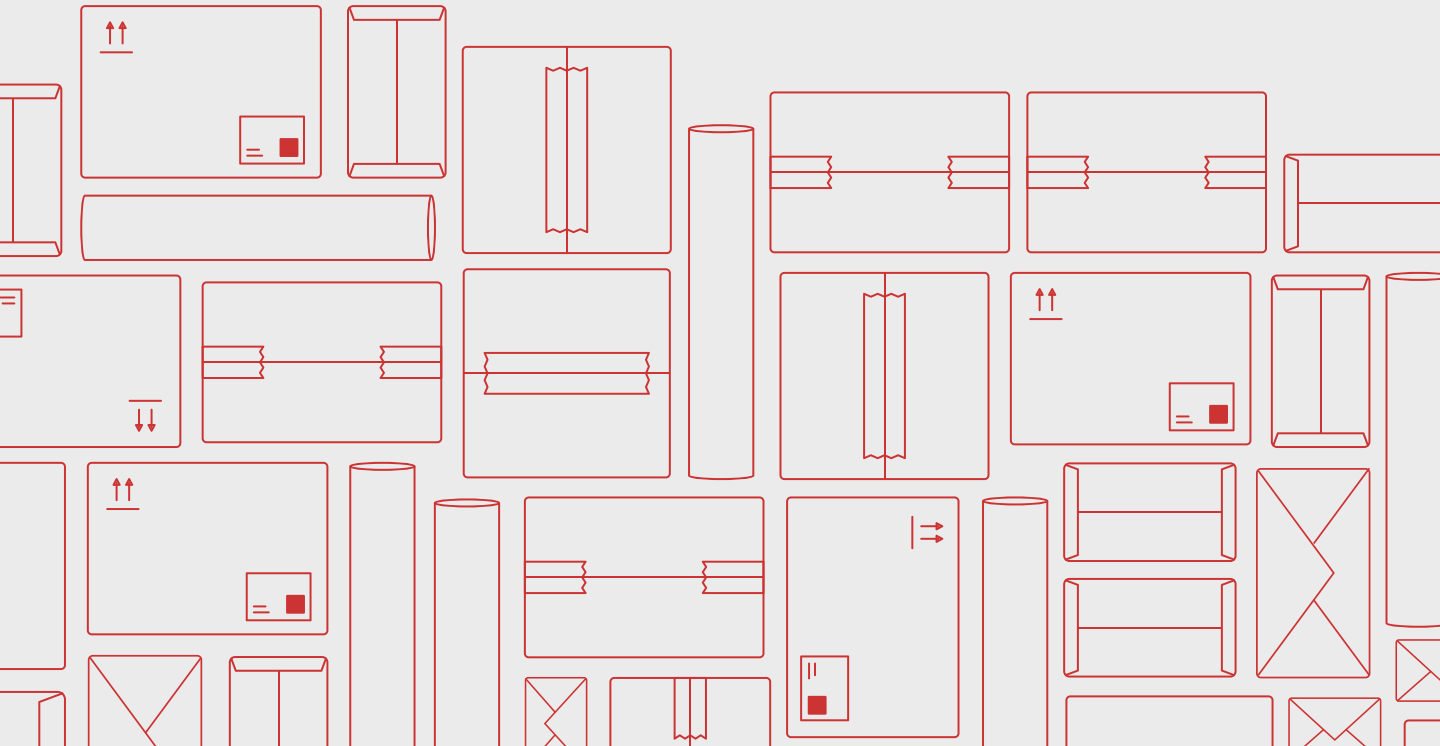
Stage 2: \$750,000

Up to **eight (8) finalists** will be selected to share a prize pool of \$800,000 and advance to Stage 2.

Finalists will compete for a prize pool of \$750,000, to be shared by a **grand prize winner** and a **runner-up**.



# DETECTING OPIOIDS IN INTERNATIONAL MAIL



# Much of the lethality of the opioid crisis can be attributed to fentanyl

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Fentanyl and its analogues are **highly accessible online**.

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The small quantities of fentanyl required for a dose (<2mg) make it **easy to conceal** and difficult to detect.

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The quantity and **rapid evolution of analogues** presents a challenge to chemical detection methods.



# The international mail is a distribution channel for opioid producers

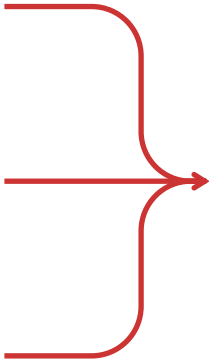
OPIOID PRODUCERS



FOREIGN POSTAL SYSTEMS



INTERNATIONAL SERVICE CENTERS



# International Service Centers stand at a key juncture for stemming the flow of opioids through the mail

OPIOID PRODUCERS



FOREIGN POSTAL SYSTEMS



INTERNATIONAL SERVICE CENTERS



# The five ISCs vary significantly in their levels of automation and mail volume received

There are 5 International Service Centers located across the U.S., through which most international mail is processed:



# Inside an International Service Center: 3 key opportunities in the mail inspection workflow

We advise solvers to target solutions in these stages of the process:

ARRIVAL

**UNLOADING**

**SEGREGATION**

**INSPECTION**

TESTING

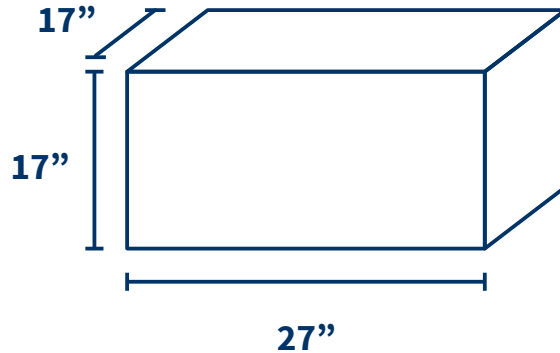
Pallets are unpacked and the barcode on each bag is scanned, often manually. Parcels enter sorting process.

Parcels identified as high risk by CBP are separated by the USPS for inspection.

CBP officers conduct nonintrusive inspection of the segregated parcels. Cleared parcels return to the normal mail stream.

# What types of mail will solutions inspect?

Conveyor-handled parcels are the most likely vehicles for opioids.



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Conveyor-handled parcels are those which can be processed using conveyor systems.

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They are typically 27" x 17" x 17" or smaller, and rectangular in shape.

# What types of opioids should solutions target?

The Challenge will focus on solutions that detect fentanyl and its analogues, which may arrive in the following form factors:

## Pills



## Powder



## Other



## Patches



## Liquid



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Fentanyl and its analogues are chemically and pharmacologically similar. Examples include:

- Carfentanil
- 3-Methylfentanyl
- Fentanyl Citrate
- Isofentanyl

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They are the most dangerous opioids, and as such are DHS's top priority.



# What information sources should solutions use?

Solutions may use information which can be **nonintrusively** ascertained from the parcel or groups of parcels, such as:

## Parcel attributes

- Size
- Weight
- Packaging type/materials
- Contents, discerned from non-intrusive analysis of the package
- Handwriting



Solutions should not rely on information sourced externally from the parcel, such as:

## External information

- Sender or recipient name
- Sender or recipient address
- Criminal record
- Contents, discerned from customs data



# Solution Eligibility Requirements

**Penetration.** Solutions cannot physically penetrate the parcel in any way

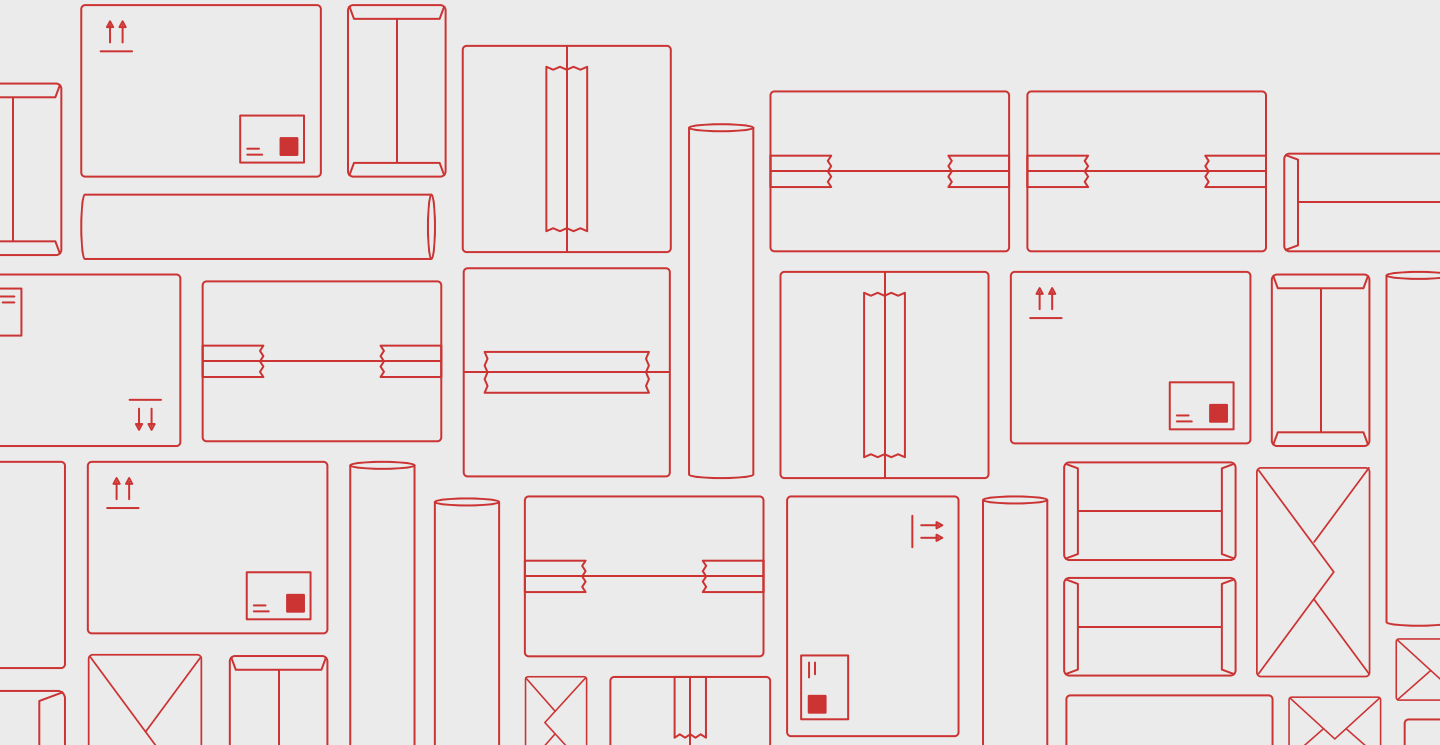
**Pretreating parcels.** Solutions cannot treat the parcels with chemicals, sprays or powders

**Solution size.** Solutions must be no larger than 180" x 81" x 78" in size

**Inspection envelope size.** Solutions must be able to process parcels up to 27" x 17" x 17" in size

*For a full list of solution eligibility requirements, please see the [Rules, Terms and Conditions](#) page on the Challenge website.*

# SUBMITTING A SOLUTION TO THE CHALLENGE



# Stage 1 Overview

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## **PARTICIPANTS:**

Individuals and legal entities globally

- This global competition welcomes submissions from all eligible\* solver teams

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## **SUBMISSION REQUIREMENTS:**

Well-developed plans

Entrants will need to provide:

- Description of solution technology, methodology for detection, and user experience
- Development plan, resource requirements, and team skills and experience
- Visual asset illustrating the specifications and functionality of your proposed solution

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## **EVALUATION:**

Expert panel

- A panel of expert judges will score submissions based on the Stage 1 Selection Criteria
- Up to eight finalists will be chosen to receive cash prizes and will be required to continue to Stage 2

*For a full list of solution eligibility requirements, please see the [Rules, Terms and Conditions](#) page on the Challenge website.*

# Stage 1 Selection Criteria

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## ACCURACY

The degree to which the solution would be able to detect, recognize, or indicate the presence of opioids in a parcel consistently and with a high degree of confidence. This includes the degree to which the solution addresses and minimizes both false positives and false negatives.

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## SPEED

The potential for the solution to rapidly inspect parcels, considered in terms of potential inspections per unit of time.

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## FEASIBILITY

The extent to which the proposed solution uses technically sound methods backed by credible supporting evidence and can be developed into a testable prototype within a four-month period.

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## FLEXIBILITY

The extent to which the solution could adapt to a changing threat, including shifts in trafficker behavior, changes to opioid chemical composition patterns, and detection of other threats such as new drugs or explosives.

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## USABILITY

The ease with which operators could learn, use and maintain the solution.

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## TEAM

The extent to which the solver or solver team demonstrates the strong experience, commitment, and ability needed to develop the solution from plan to testable prototype within the time and resource constraints of the Challenge.

# Stage 2 Overview

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## **PARTICIPANTS:** Stage 1 finalists

- Stage 1 finalists will participate in a 14-week prototyping accelerator, to advance their solutions and compete for additional prizes

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## **SUBMISSION REQUIREMENTS:** Testable prototypes

Finalists will need to develop:

- A physical, prototype version of the solution that can be tested in a controlled setting

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## **EVALUATION:** Expert panel and live test event

- A panel of expert judges will score submissions based on the Stage 2 Selection Criteria
- A standard testing approach will be applied to all solutions using DHS-provided test equipment and samples, at a DHS selected facility.

# Judges



**José R. Almirall, Ph.D.**  
Director, Center for  
Advanced Research in  
Forensic Science



**Michael M. McCormick, Ph.D.**  
Science Officer, U.S. CBP



**Manuel A. Garza Jr.**  
Director, Manifest and  
Conveyance Security  
Division, U.S. CBP



**Abi Ramanan, LL.B.**  
Founder and CEO,  
ImpactVision



**Eric Houser, Ph.D.**  
Senior Technical Advisor,  
Office of Requirements &  
Capabilities, TSA



**Stephanie L. Smith, M.S.**  
Scientific & Technical Advisor  
US Postal Inspection Service



**Stephen D. McConachie**  
Chief Operations  
Manager, U.S. CBP

# Solver Team Eligibility

**Solvers from all countries are invited to participate, with the exception of the following:**

- Those on government exclusions lists
- Individuals under the age of 18
- Felons
- Parties with government affiliation should ensure participation is permitted.

*For a full list of solver team eligibility requirements, please see the [Rules, Terms and Conditions](#) page on the Challenge website.*



# Intellectual Property

## Submission License policy summary

- Entrants retain ownership of their submission
- Entering the Challenge means granting DHS and Luminary Labs a perpetual license to store, access and modify submissions

See the [Rules, Terms and Conditions](#) page on the Challenge website for the full IP policy.

# Stage 1 Submission Instructions

To complete your submission, you will need to do the following **by 4:59 pm ET on Wednesday, April 24, 2019:**

- 1** Identify an eligible Team Lead
- 2** Create a Luminary Lightbox™ account, and link other team members
- 3** Complete the submission form on [www.opioiddetectionchallenge.com/submit](http://www.opioiddetectionchallenge.com/submit)
- 4** Submit your entry

It is highly recommended that you **complete all of these steps well ahead of the deadline**, to allow time to resolve any potential technical issues.

# Q&A

**Please submit questions in the chat window within Adobe Connect.**

If we do not get to your question, please check the Challenge blog, where we will published responses to many questions received. Published answers, not live answers to questions, will be considered final responses. Please refer to the website for official details on the Challenge.

Additional questions may be sent to  
**[hello@opioiddetectionchallenge.com](mailto:hello@opioiddetectionchallenge.com)**

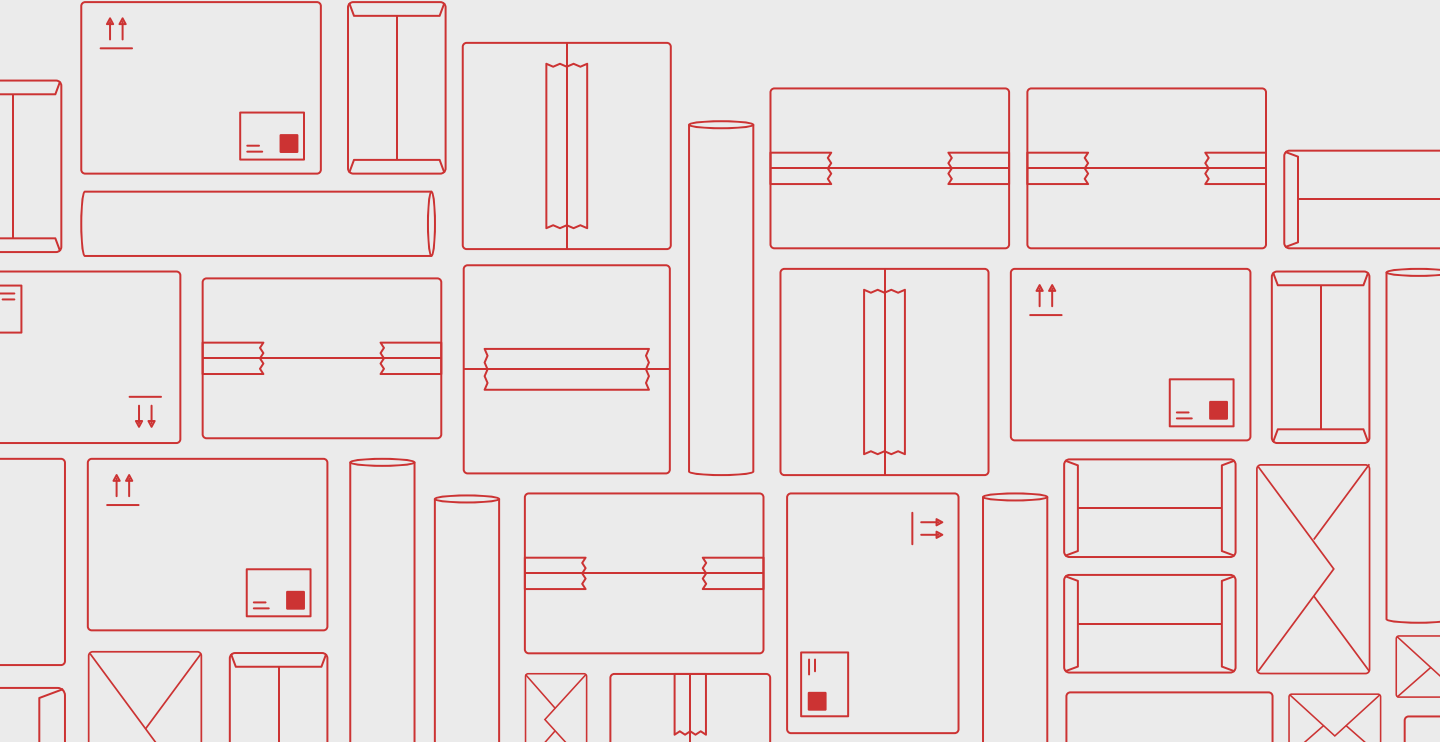


# Thank you

For more information and to sign up for the  
Challenge newsletter, visit  
[www.opioiddetectionchallenge.com](http://www.opioiddetectionchallenge.com)



# APPENDIX



# International Service Center Inspection Process Overview with Key Considerations

## ARRIVAL

Mail arrives in trucks filled with pallets, each with bags of mail.

## KEY CONSIDERATIONS FOR SOLVERS

The U.S. Customs and Border Protection (CBP) uses various data sources to evaluate and **triage parcels according to risk**, flagging and segregating high-risk parcels for increased scrutiny.

**Advanced Electronic Data (AED)** from shippers is a data source received by the U.S. Postal Service (USPS). AED and other data sets are leveraged by the U.S. Postal Inspection Service (USPIS) for **intelligence-based analyses, to predict the presence of illicit content** and generate lists of suspicious parcels. This information is provided to CBP for action.

## UNLOADING

Pallets are unpacked and the barcode on each bag is scanned, often manually. Parcels enter sorting process.

**Volume of parcels processed is variable**, depending on the day of the week as well as time of year.

Volume also **varies by facility**. John F. Kennedy International Airport (JFK), the largest of International Service Centers (ISC), processes more than half of all international mail.

The ISC at JFK processes roughly 800,000 parcels per day, so efficient movement of parcels must be preserved.

## SEGREGATION

Parcels identified as high risk by CBP are separated by the USPS for inspection.

This can be a **highly manual process**. In some facilities, USPS workers need to sort through bags of parcels by hand to find individual parcels for inspection.

**How traffickers package opioids** is one of the signals officers use to separate parcels for closer inspection.

The **human-machine interface** is important. Tools that can be deployed, updated, and redeployed quickly and easily will be more effective than a rigid system.

## INSPECTION

CBP officers conduct nonintrusive inspection of the segregated parcels. Cleared parcels return to the normal mail stream.

Containers and equipment used to process parcels are **reused continually**, so they may be **contaminated with trace levels of opioids or other chemicals** that could hinder chemical detection.

Opioids may or may not be actively concealed within a parcel.

Officers frequently share information on trafficker micro-trends.

## TESTING

Parcels deemed likely to contain drugs or other contraband are opened and evaluated.

Technology that helps officers avoid opening parcels which do not contain opioids would help save significant time.

If parcels contain substances that look like opioids, they are chemically tested at an in-house lab.

**We advise solvers to target solutions to these stages of the process**

Source: The information included in this process overview is a high-level summary of research performed by Luminary Labs. It is not representative of this process in its entirety. The information shown is intended for the sole purpose of aiding solvers in the Opioid Detection Challenge, and does not attempt to summarize all mail processing or inspection procedures.



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