

Butane by Rail

A prototype you can model



Overview

- Butane uses
- Source and production
- Logistics
- Modeling butane

The Clean Air Act

- Goal: Reduce smog
 - Oxygenates
 - Butane
- Impact – rise of petroleum by rail

Butane Basics: Types and Uses

Types and uses:

1. Purity normal butane – petrochemical feedstock
2. Refinery grade normal butane – gasoline additive
3. Isobutane – octane enhancer

Butane Basics: Production

Fractionation
plants:
Enterprise
Products
Fractionation
Plant,
Mt. Belvieu, TX



Refineries:
Shell Martinez, CA

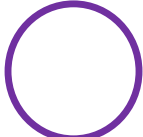



Butane Logistics

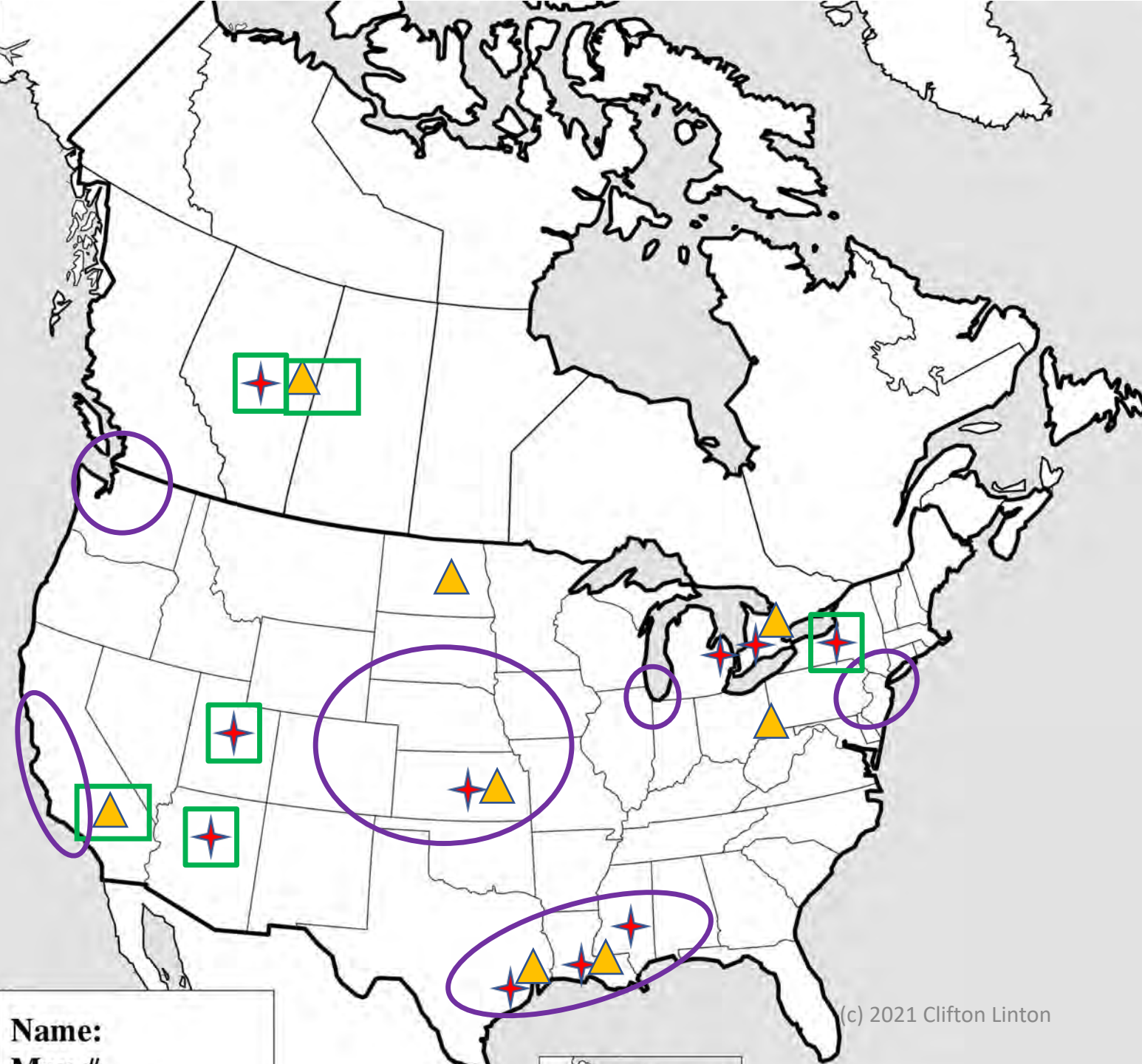
- Cargo Characteristics
- Typical transport modes
 - Pipeline
 - Rail
 - Truck



Butane logistics challenge

- Production is far from consumption
- Pipeline network limited

-  Refinery clusters
-  NGL production and fractionation
-  Underground NGL storage hub
-  Facilities without pipeline connection, served by rail and truck



Butane: logistics conundrum

- Normal butane, isobutane see seasonal demand
- Plants run year round
- What to do?

The Answer -- RAIL!!

- Why we, as modelers, care:
- Carload moves
- Multiple scenic opportunities
- Could fit on many layouts



Butane: What to model?

- Storage – cavern, on-track
- Production - Refinery, fractionation plant
- Users – Refinery, blenders

Butane: Must-have elements

- **Tank cars**
- **Tank car loading/unloading rack**
- **Fencing**
- **Piping**
- Spherical bulk storage tanks – optional
- Production plant – optional



Modeling detail – DOT-112 pressurized tank car

Emergency
Fire, or Accident
in the USA
1-800-9300
USA (Call Collect)
1-800-3887
Only (Call Collect)
1-800-6666

DOT 112J340W

	STATION EFFECTS	QUALIFIED	DUE
TANK QUALIFICATION	TICK	2016	2026
THICKNESS TEST	TICK	2016	2026
SERVICE EQUIPMENT	TXIX	2016	2026
PRD: VALVE 280.5 PSI	TXIX	2016	2022
LINING:			
88.B.2 INSPECTION	TXIX	2016	2026
STUB SILL INSPECTION	TXIX	2016	2026

**NON-ODORIZED
LIQUEFIED PETROLEUM GAS**

FRA AIP

OWNERSHIP SUBJECT TO A SECURITY AGREEMENT
FILED WITH THE SURFACE TRANSPORTATION BOARD

PAINT - STRATHMORE RAILPLEX GATX
TRN - TXIX 07-2016

BLT- 07-2016

LIFT HERE



2 INCH TREAD COND SHOES

Modeling detail: stencil/placard

TEST	TICK	2016	2026
EQUIPMENT	TXIX	2016	2026
VALVE 280.5 PSI	TXIX	2016	2022
INSPECTION	TXIX	2016	2026
SILL INSPECTION	TXIX	2016	2026

GATX

LD LMT 163
LT WT 99

LIFT HERE

1075

2

2 INCH TREAD COND SHOES

FSA-I1EN-UA

GATX 219665

LIFT HERE

2 INCH TREAD COND SHOES

2-15 ASF

MOTION CONT

FSA-I1EN-UA

GATX 218310

Modeling detail: shelf coupler



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Modeling detail - fencing



Modeling butane operations

- What is the plant's daily production/loading capacity?
- How many cars/day?
- How many cars do you need staged?

Modeling butane operations – case study

- 90,000 b/d refinery
- 3,000 b/d of butane (1 bbl = 42 gal)
- 4-spot rail rack
- How many rail cars per day?
- How many on hand?

Modeling butane operations – case study

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- 3,000 b/d of butane (1 bbl = 42 gal)
- 4-spot rail rack
- How many rail cars per day? 4.2
- How many on hand?

Modeling butane operations – case study

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- How many on hand? 13



Staged tank cars – Aux Sable



Model detail: Switching the plant

Modeling butane: Placing tank cars in a train's consist

- 6 deep
- If 6 deep is not possible add a non-placarded buffer car.

