

FloCon2010

Keynote

Bill Woodcock
Research Director
Packet Clearing House

Most of you are working with flow data to improve security.



But...

Flow data can improve Internet service billing.

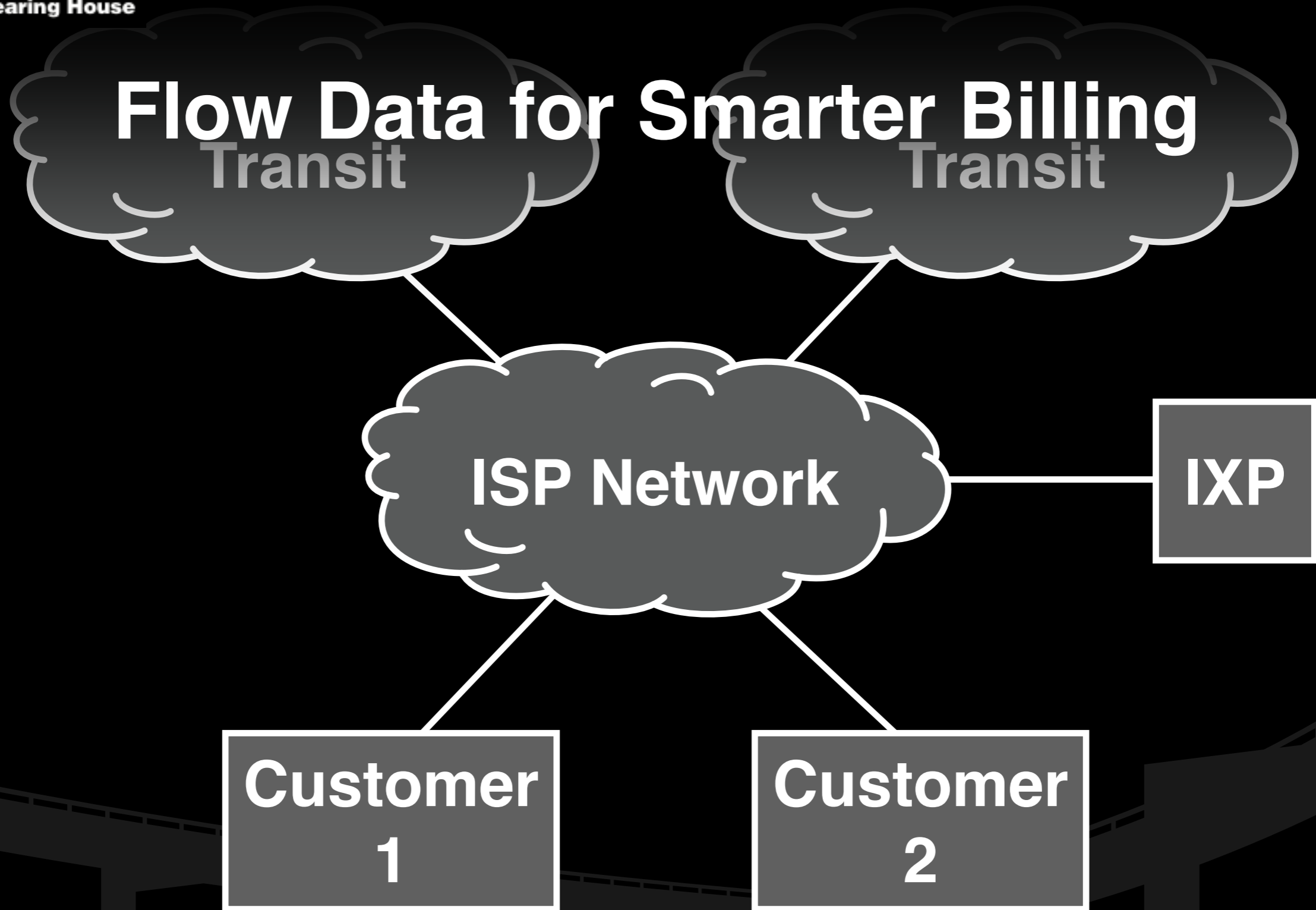
Flow data can optimize routing.

Flow data itself is becoming a tempting target.

Flow Data for Smarter Billing

The problem:

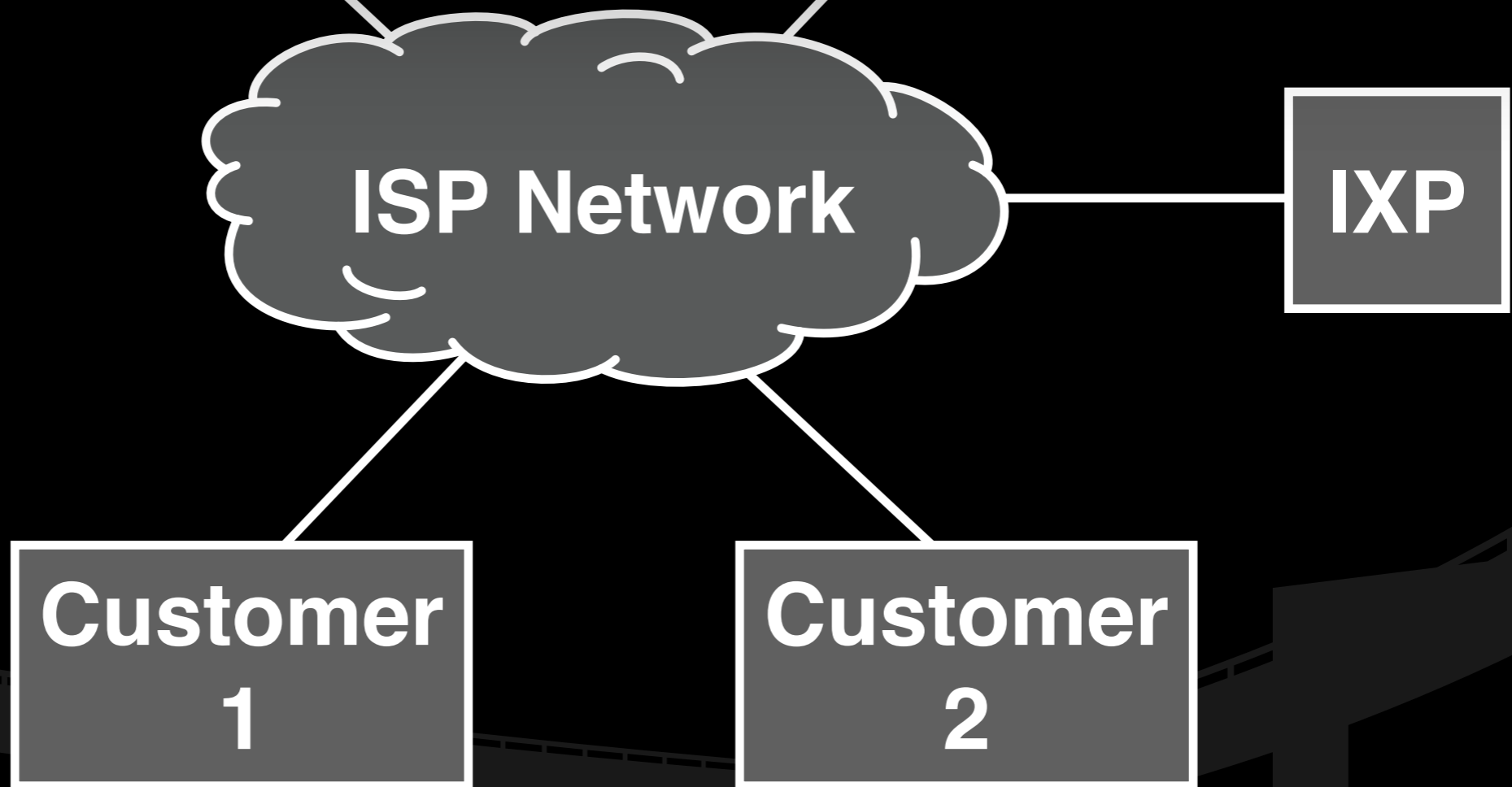
Business models for selling Internet access are constrained and crude when ISPs use simple interface bit-counters.



Flow Data for Smarter Billing

Transit

Transit



Customer
1

Customer
2

IXP

ISP Network

Flow Data for Smarter Billing

Transit

Transit

**Router Interface
Bit Counter**

ISP Network

IXP

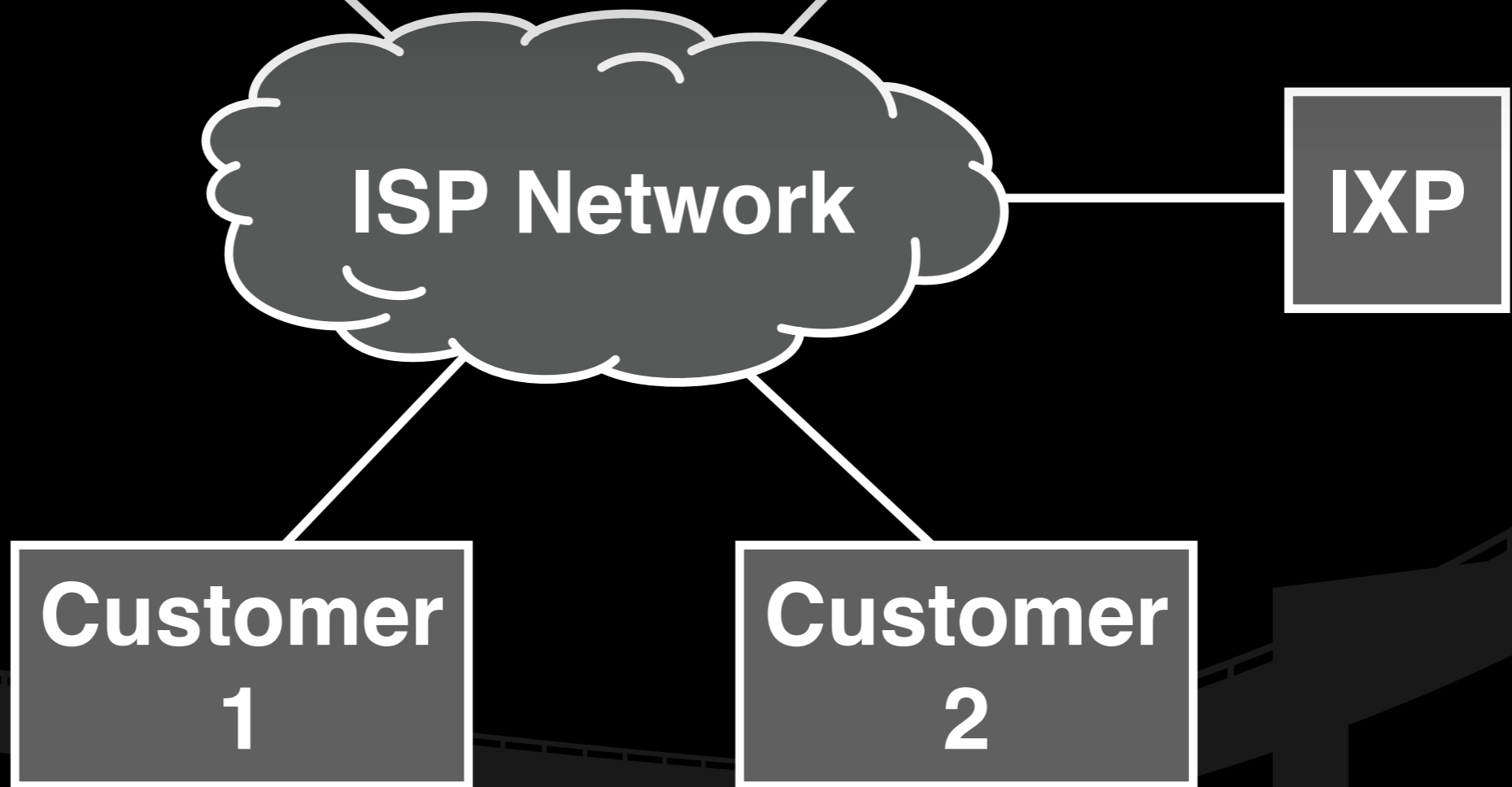
**Customer
1**

**Customer
2**

Flow Data for Smarter Billing

Transit

Transit



Customer
1

Customer
2

ISP Network

IXP

Flow Data for Smarter Billing

Transit

Transit

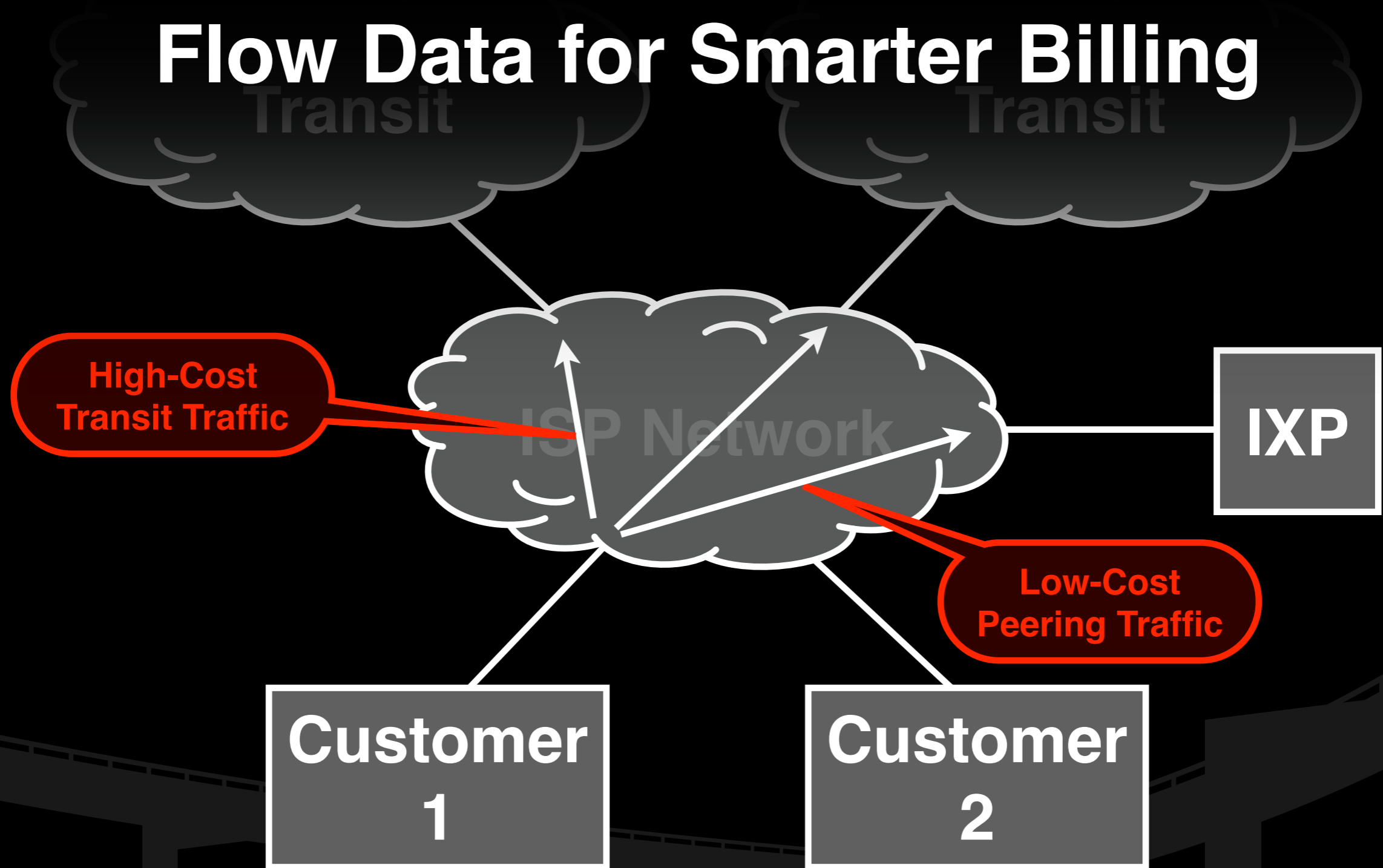
ISP Network

IXP

Customer
1

Customer
2

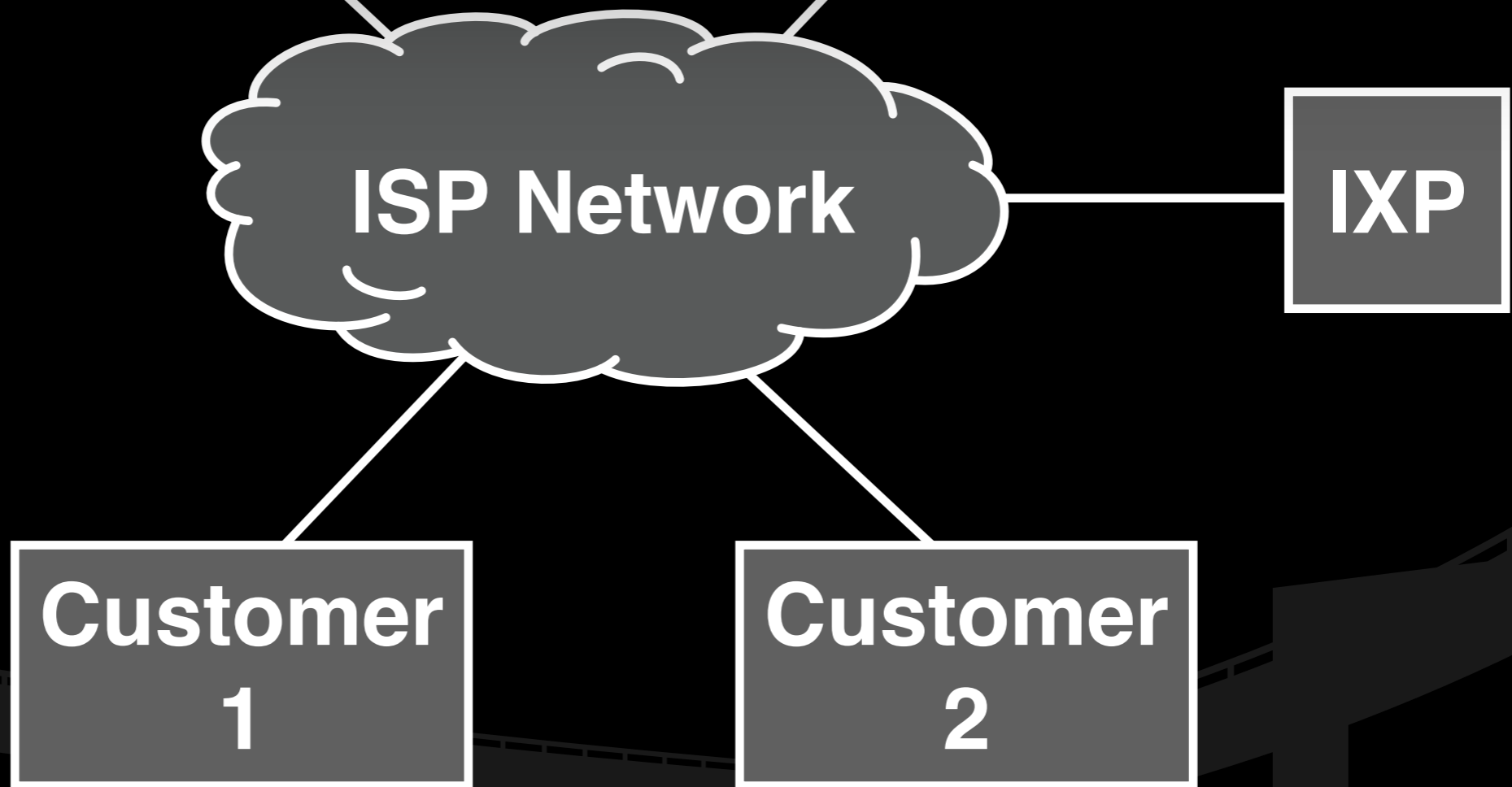
Flow Data for Smarter Billing



Flow Data for Smarter Billing

Transit

Transit



Customer
1

Customer
2

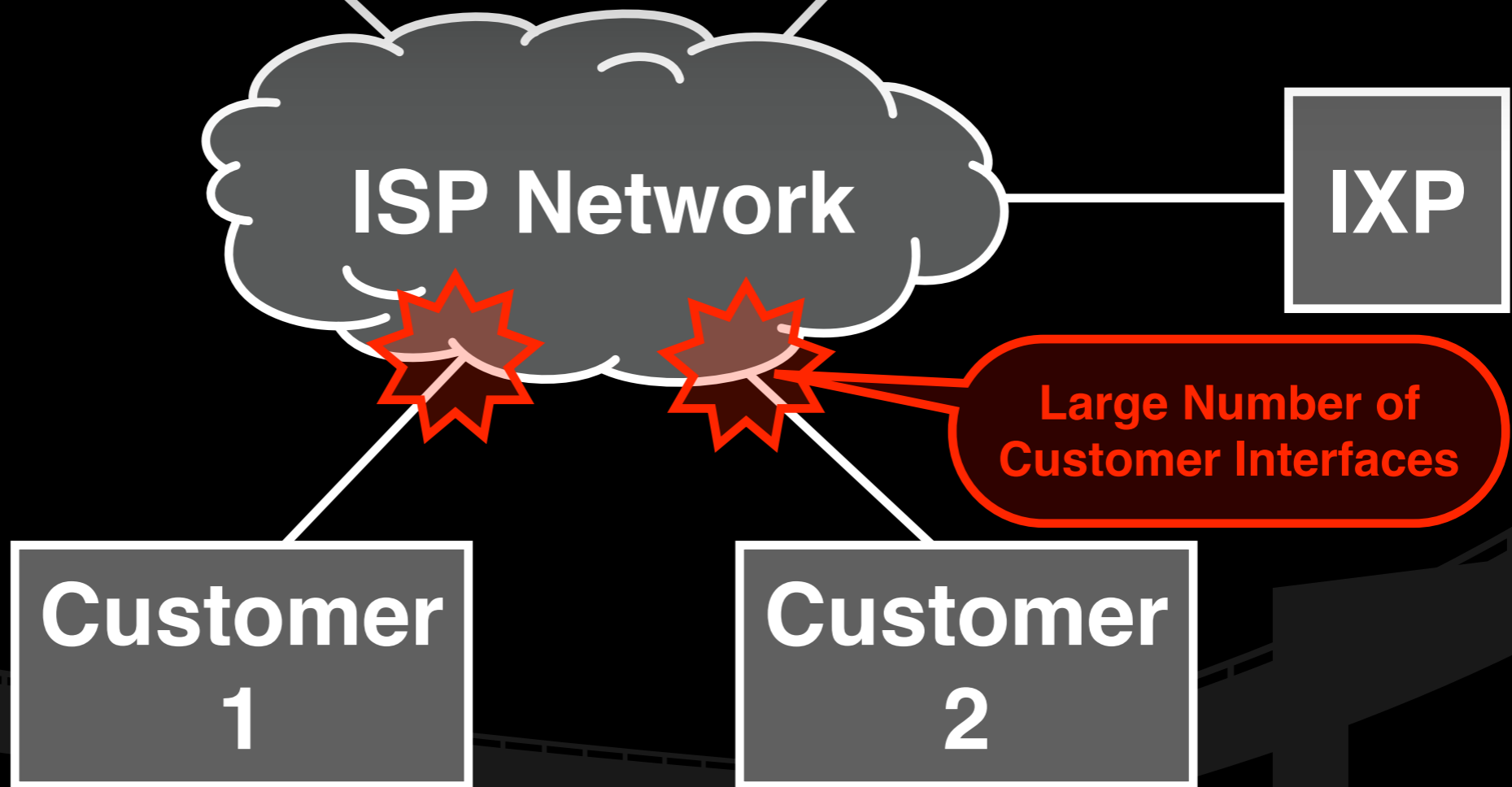
IXP

ISP Network

Flow Data for Smarter Billing

Transit

Transit



Large Number of
Customer Interfaces

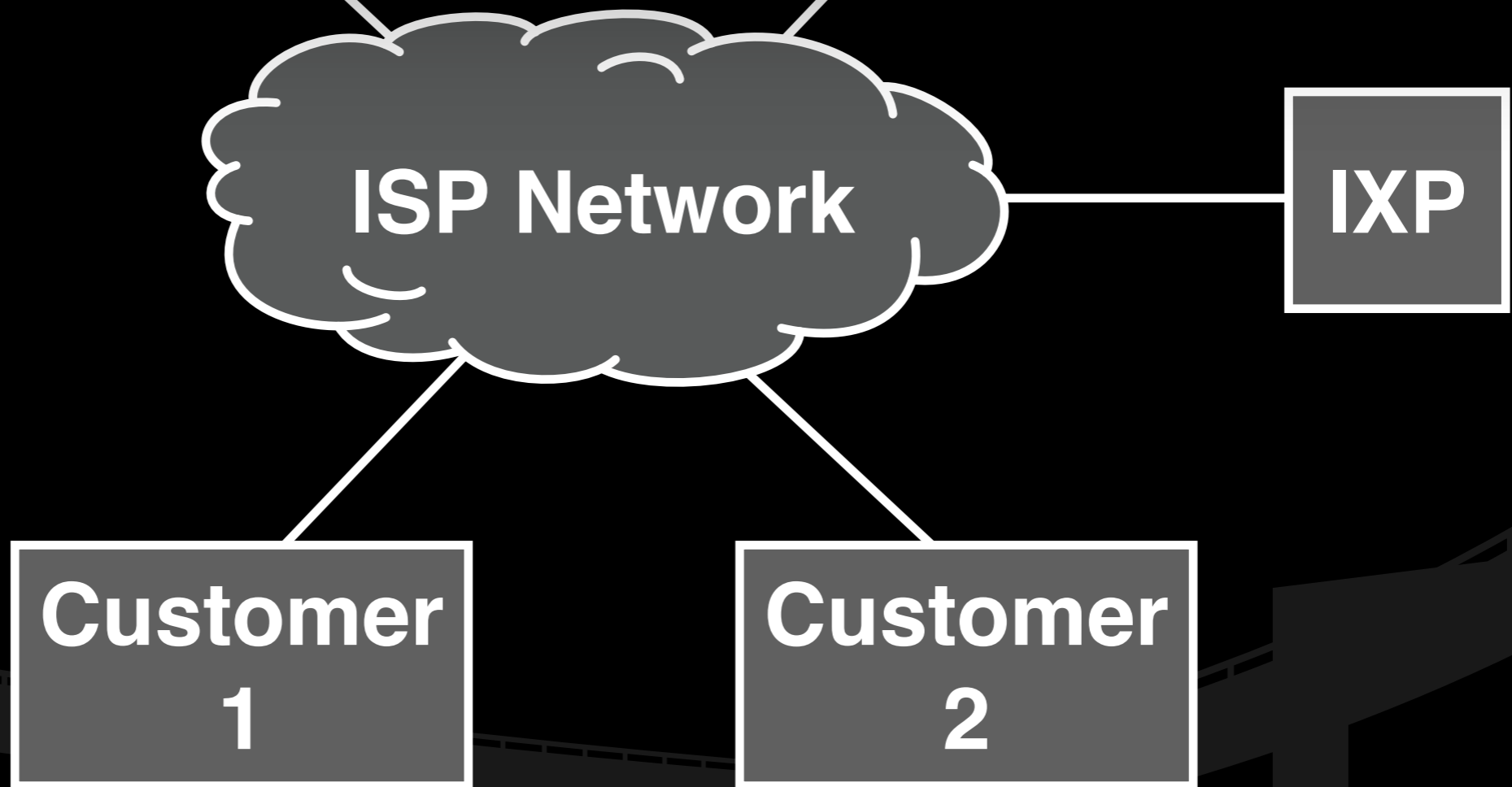
Customer
1

Customer
2

Flow Data for Smarter Billing

Transit

Transit

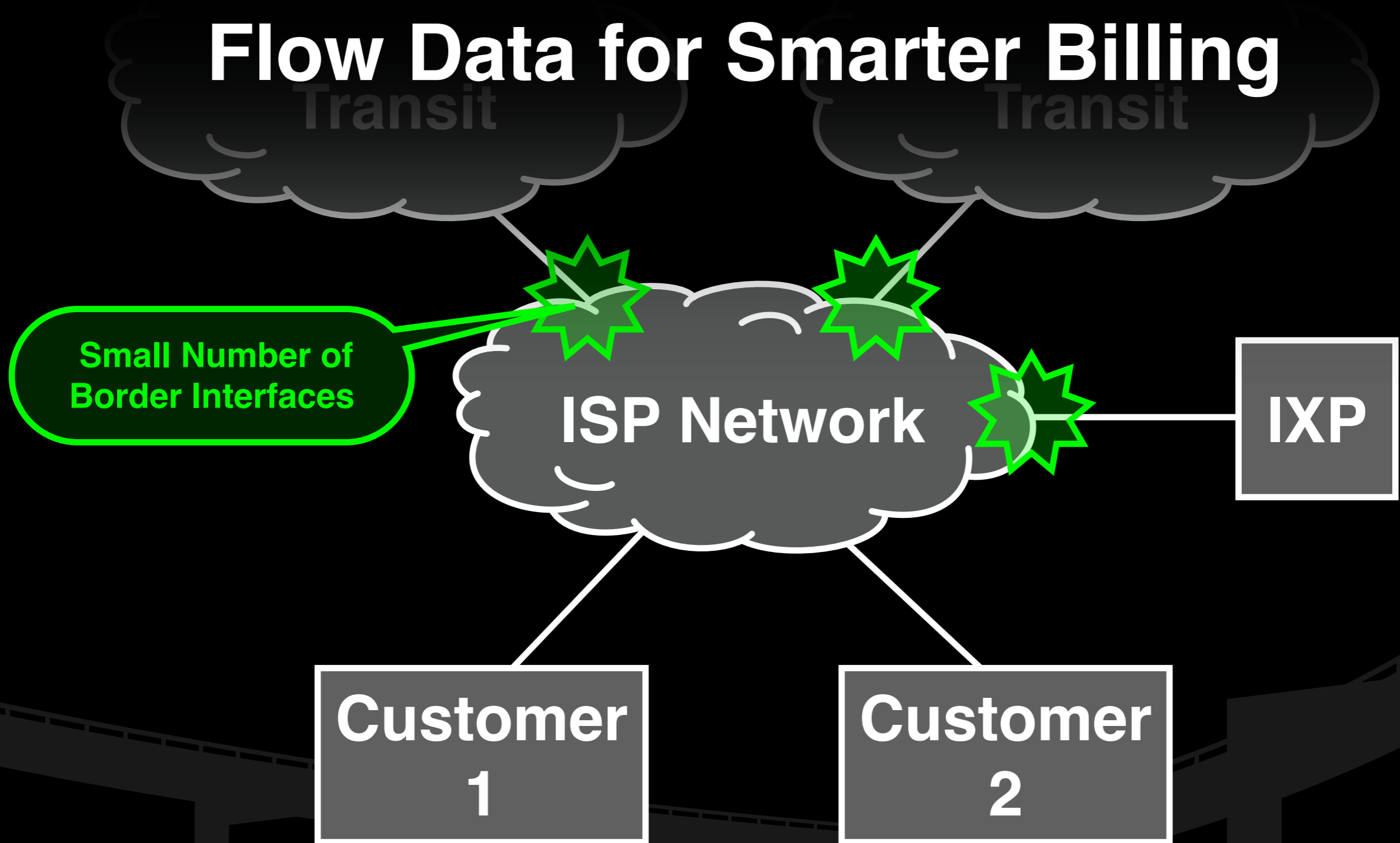


Customer
1

Customer
2

IXP

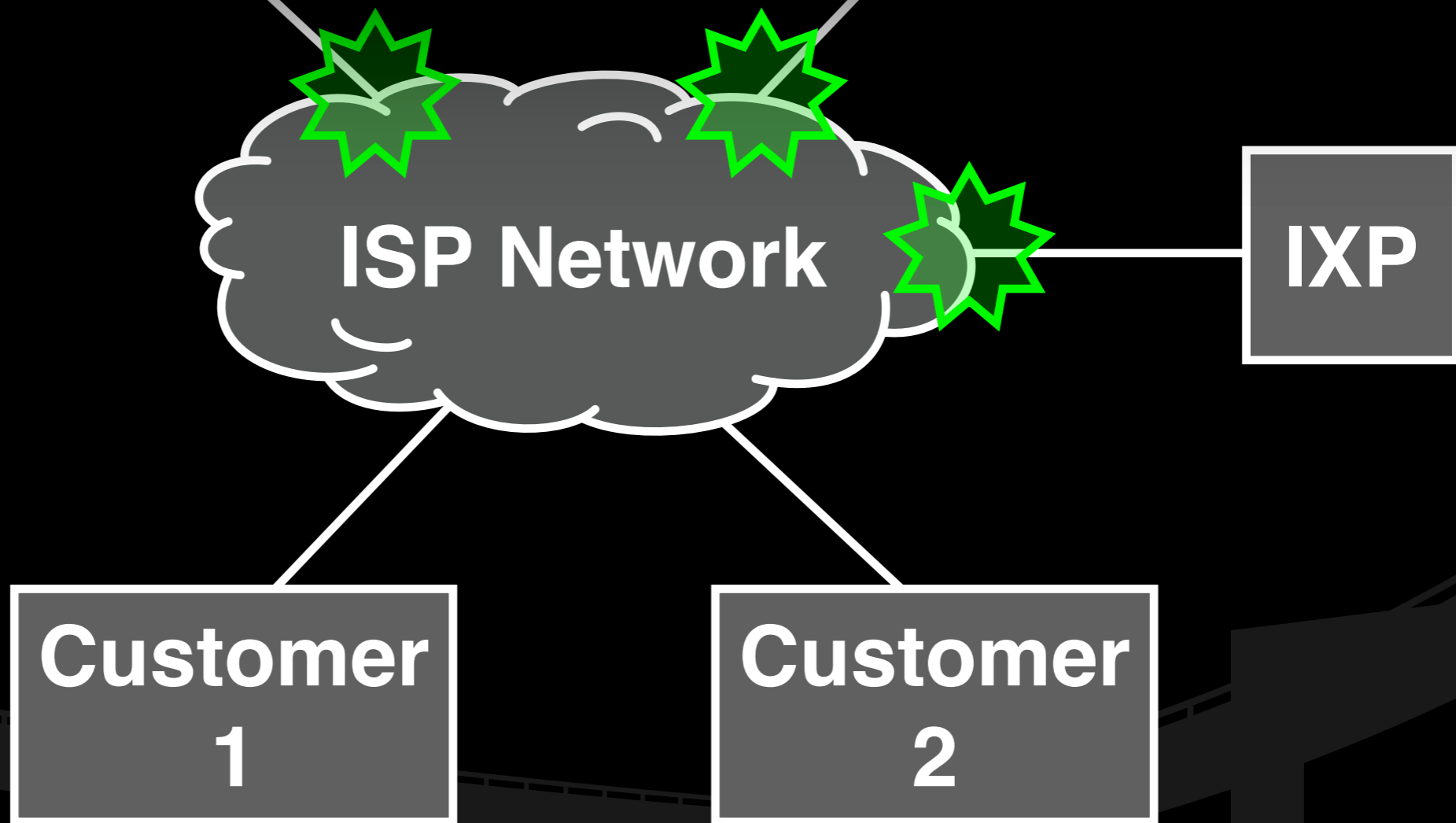
Flow Data for Smarter Billing



Flow Data for Smarter Billing

Transit

Transit



**Customer
1**

**Customer
2**

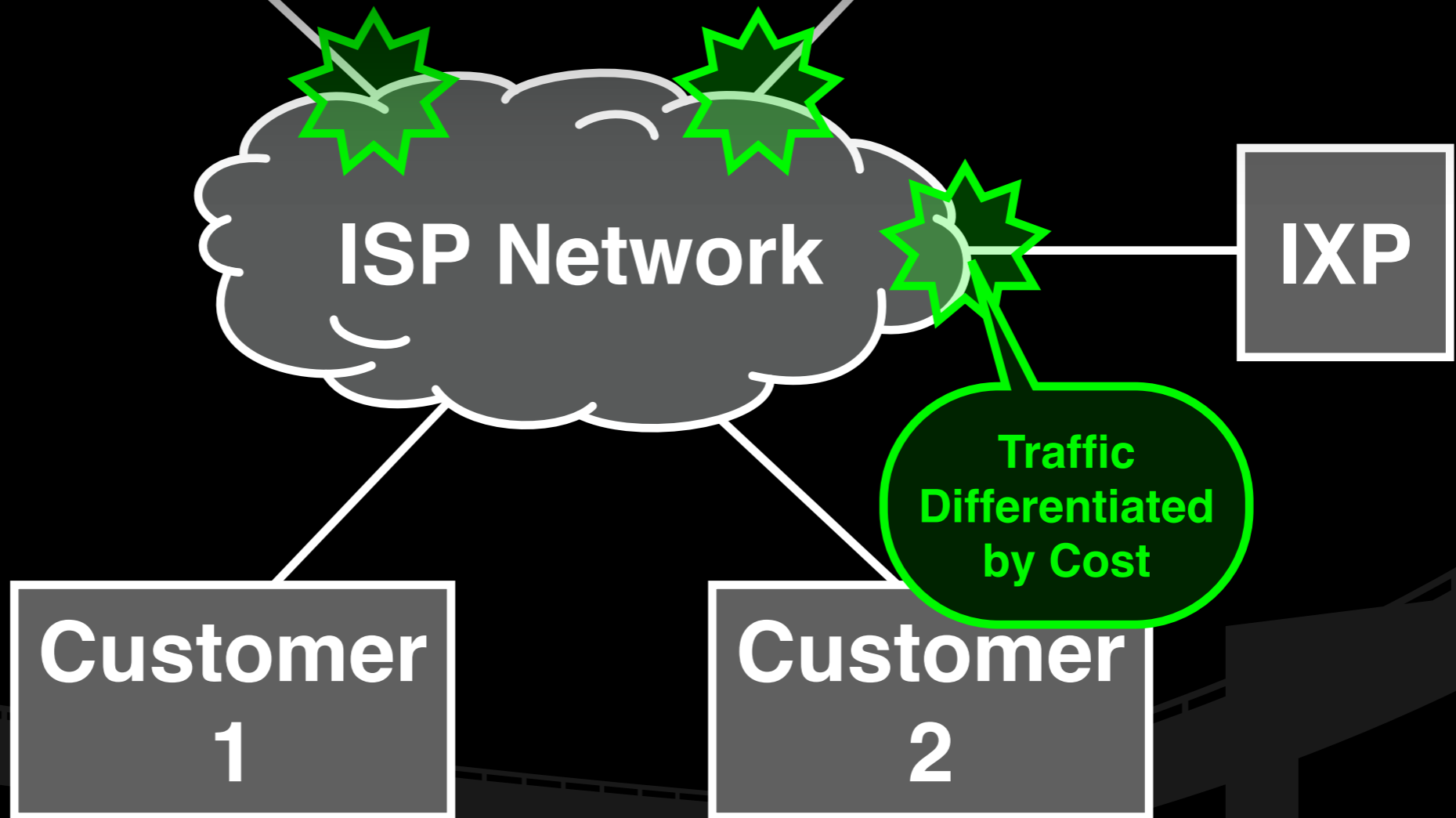
IXP

ISP Network

Flow Data for Smarter Billing

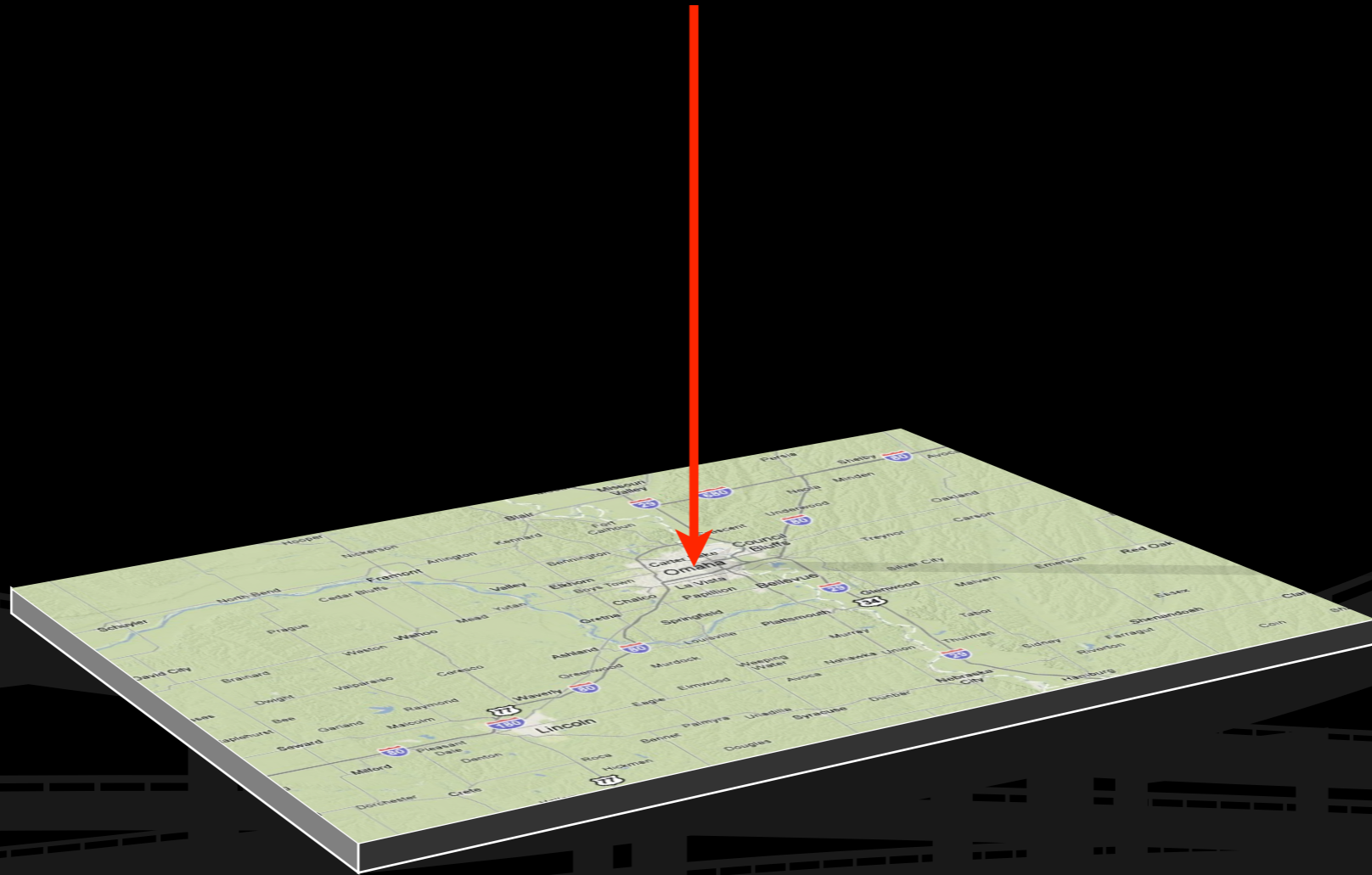
Transit

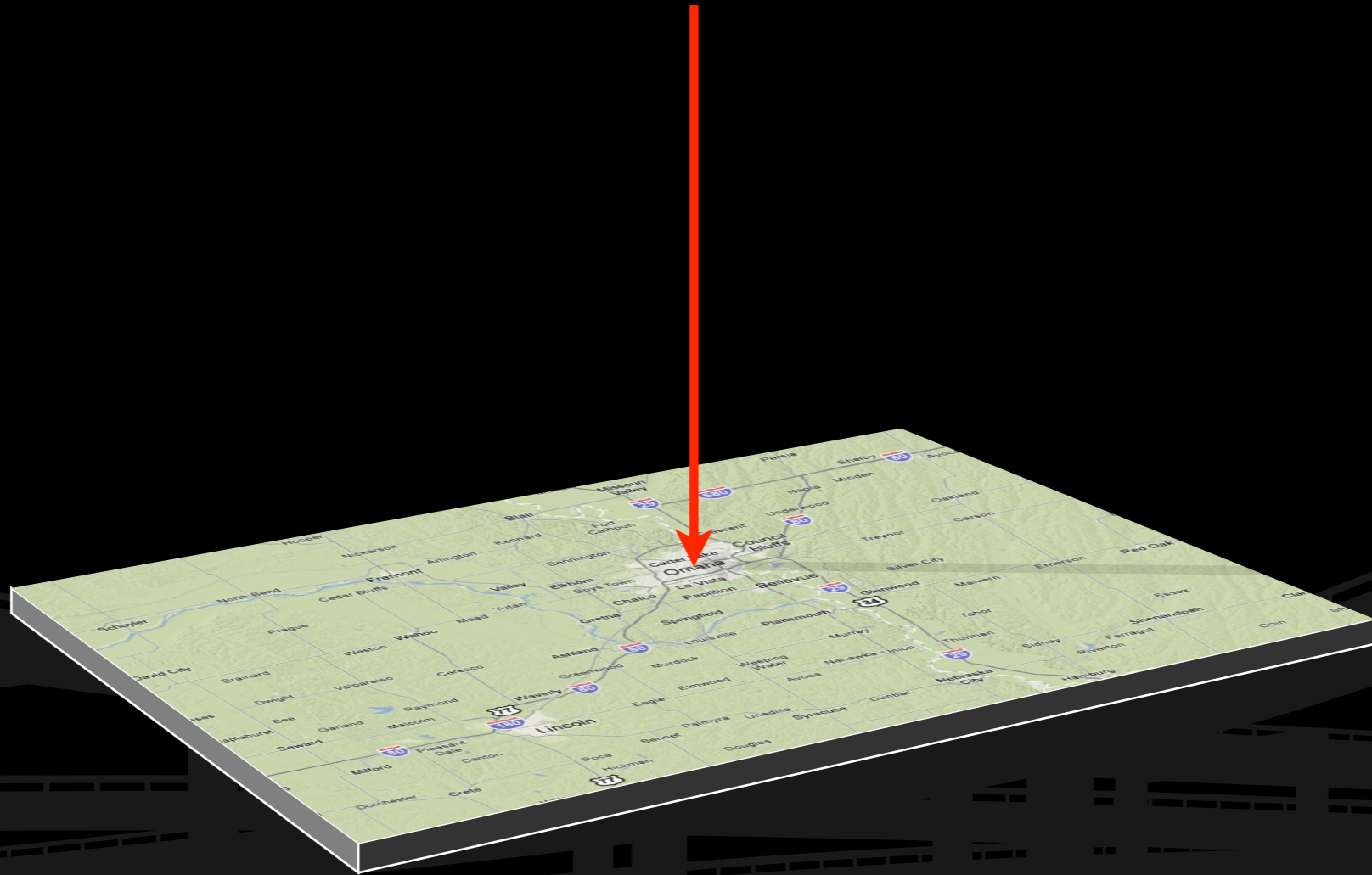
Transit

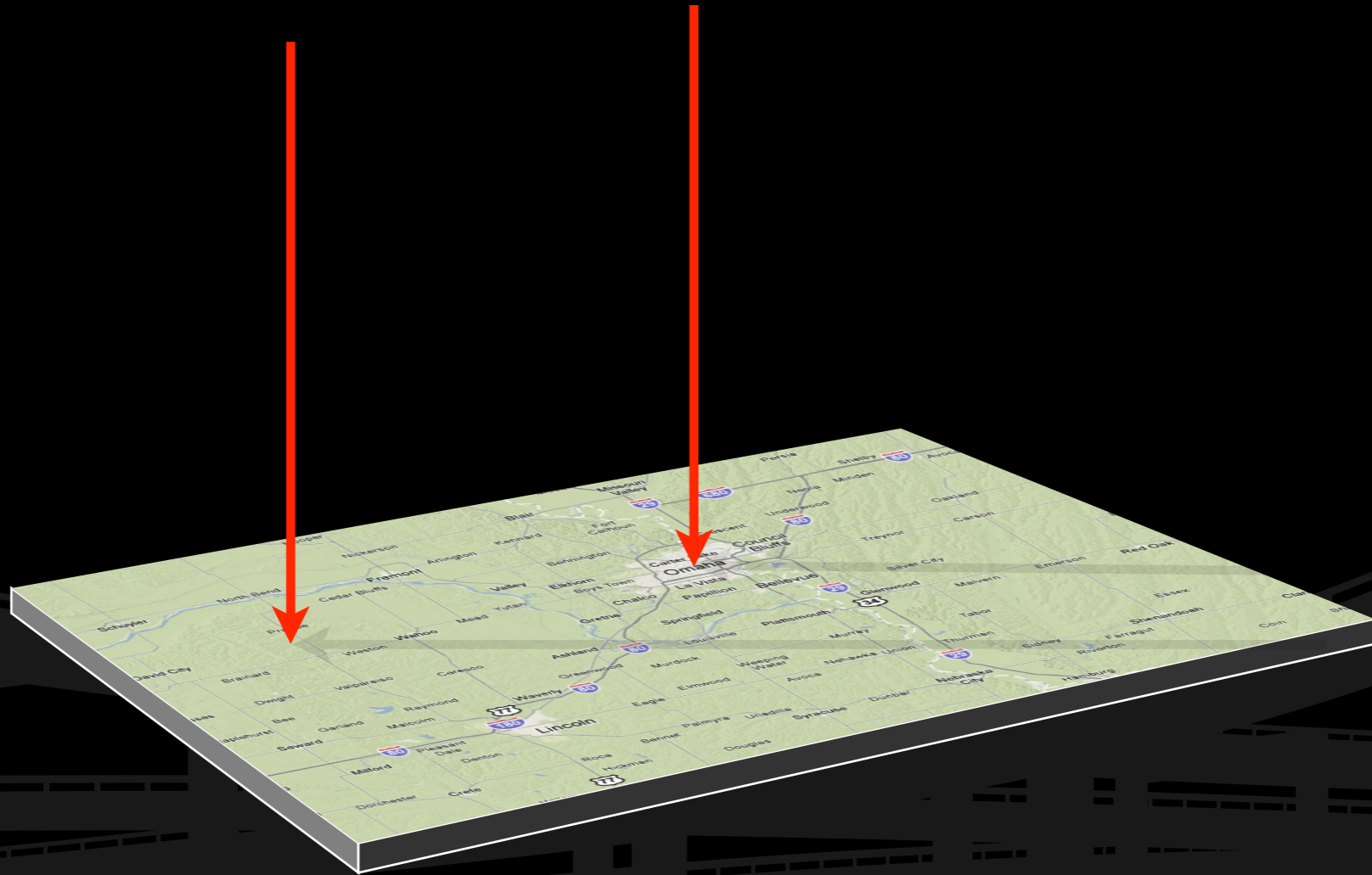


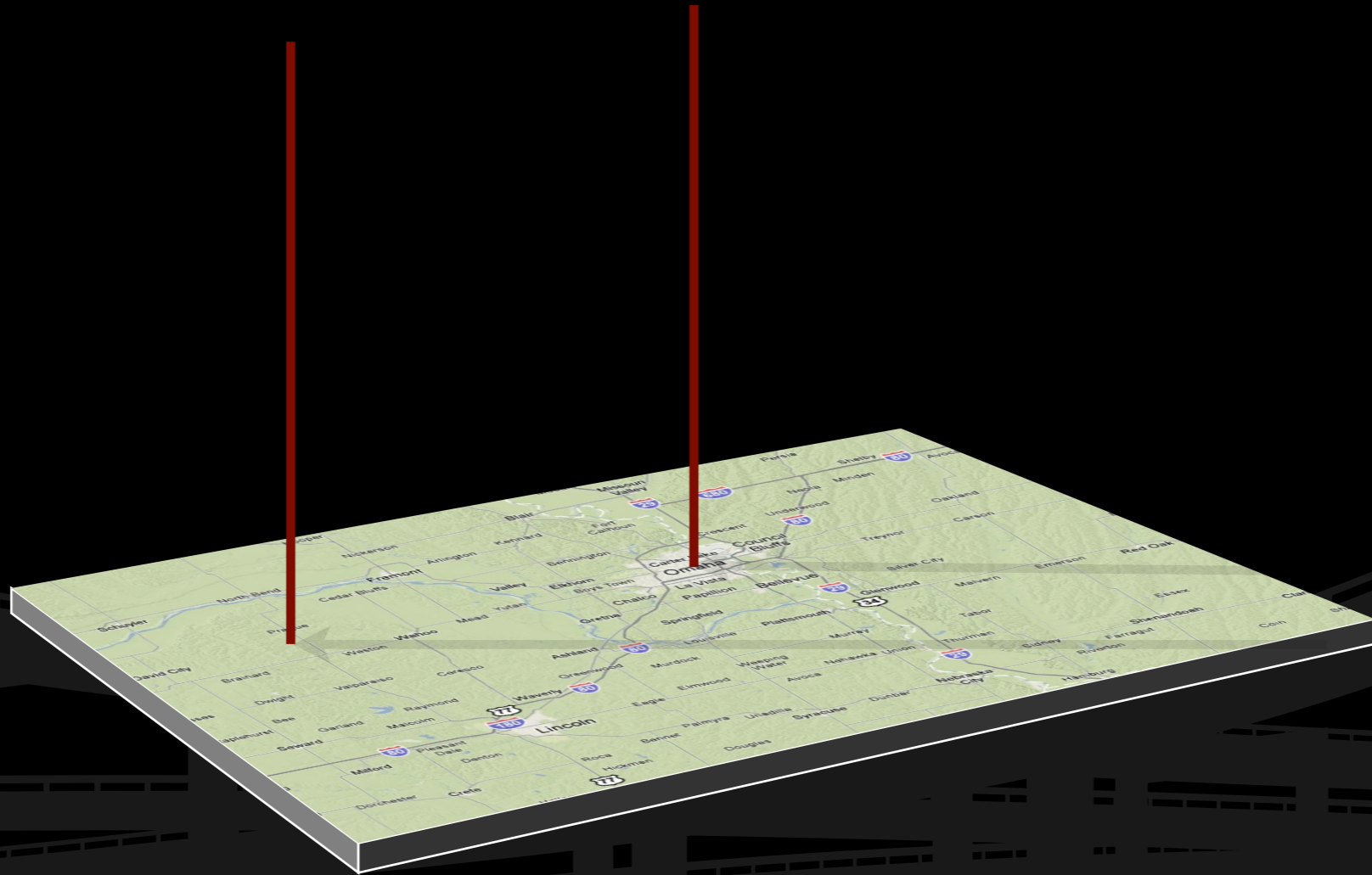
Traffic
Differentiated
by Cost

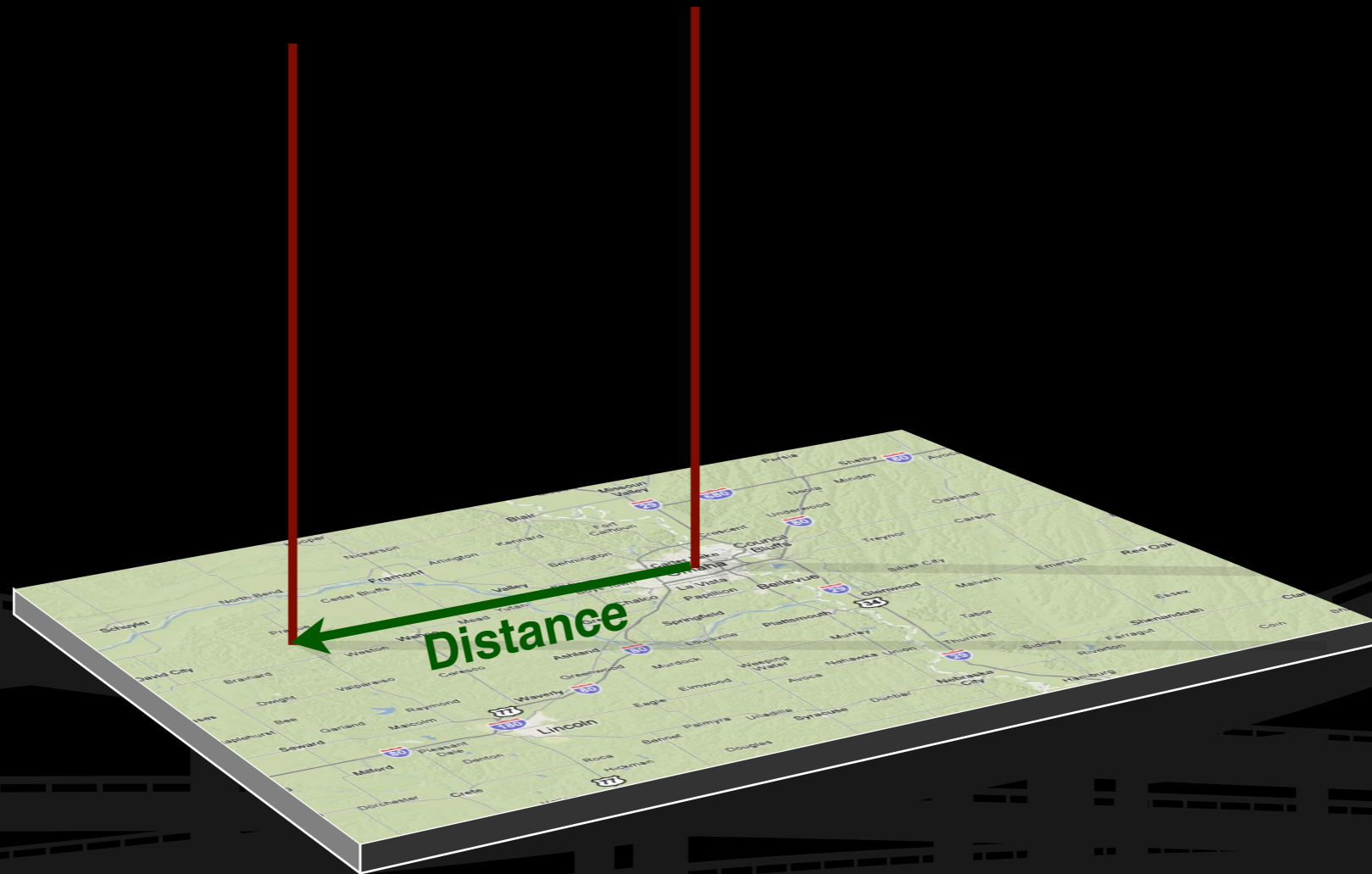


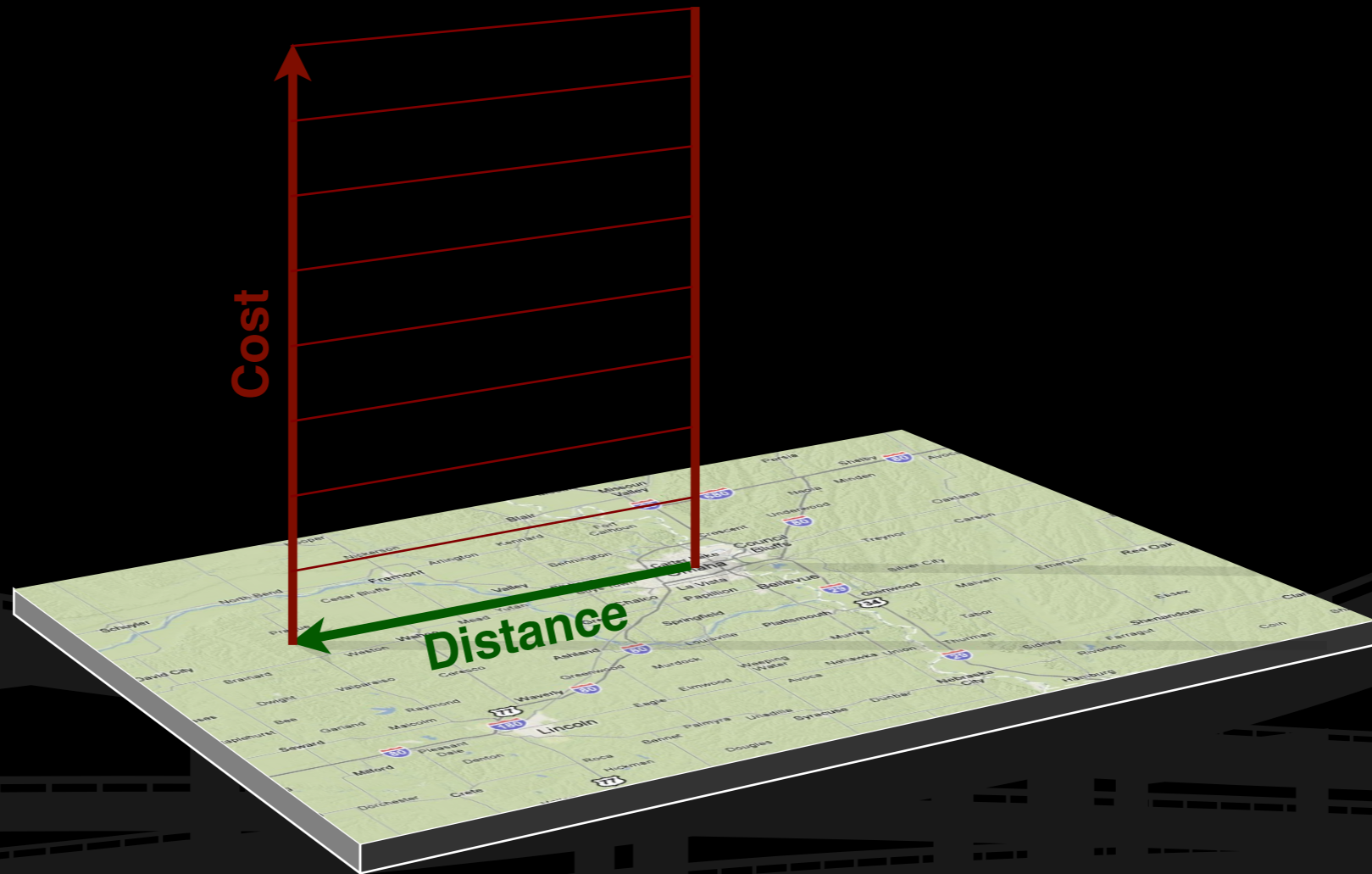


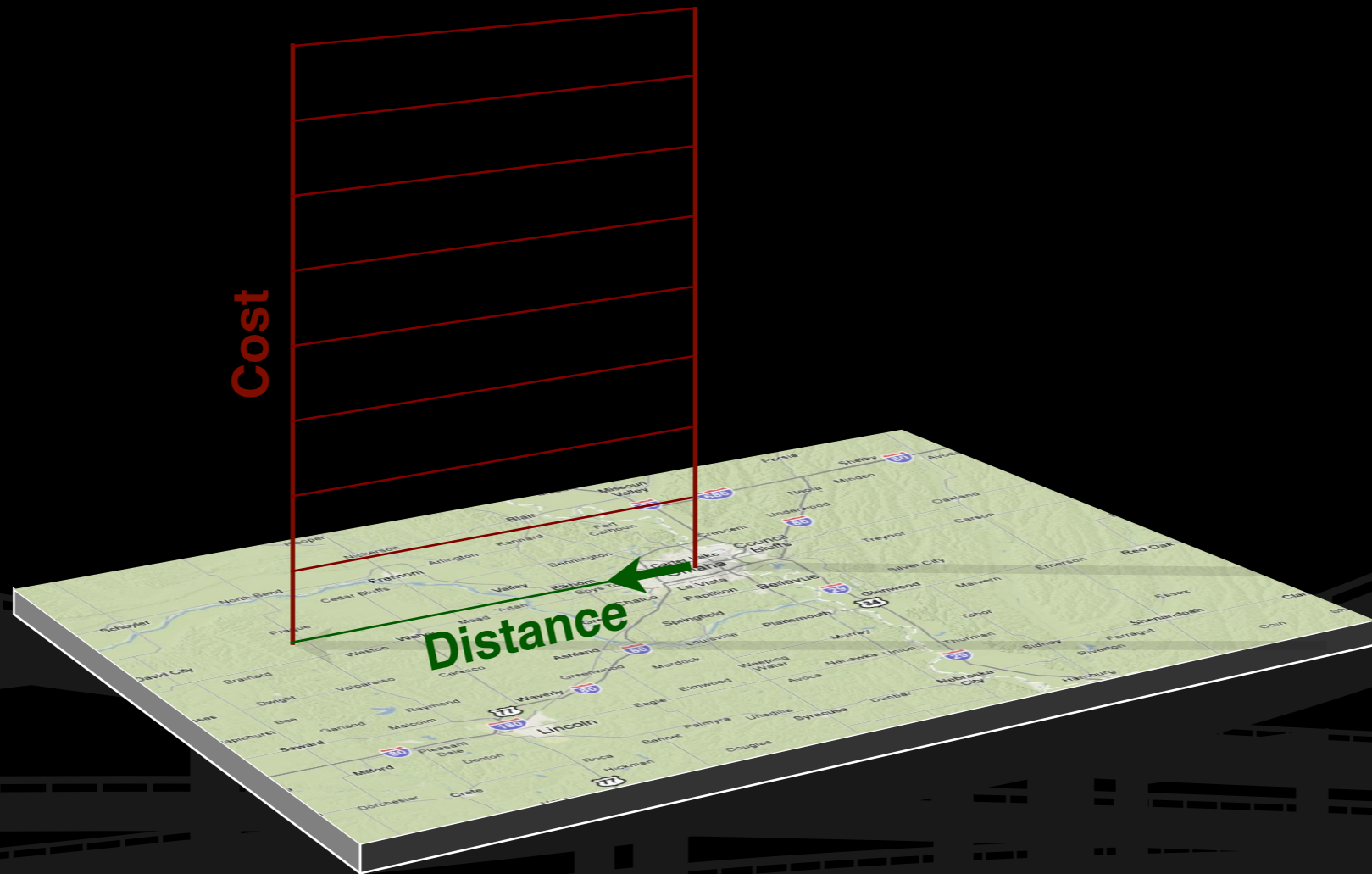


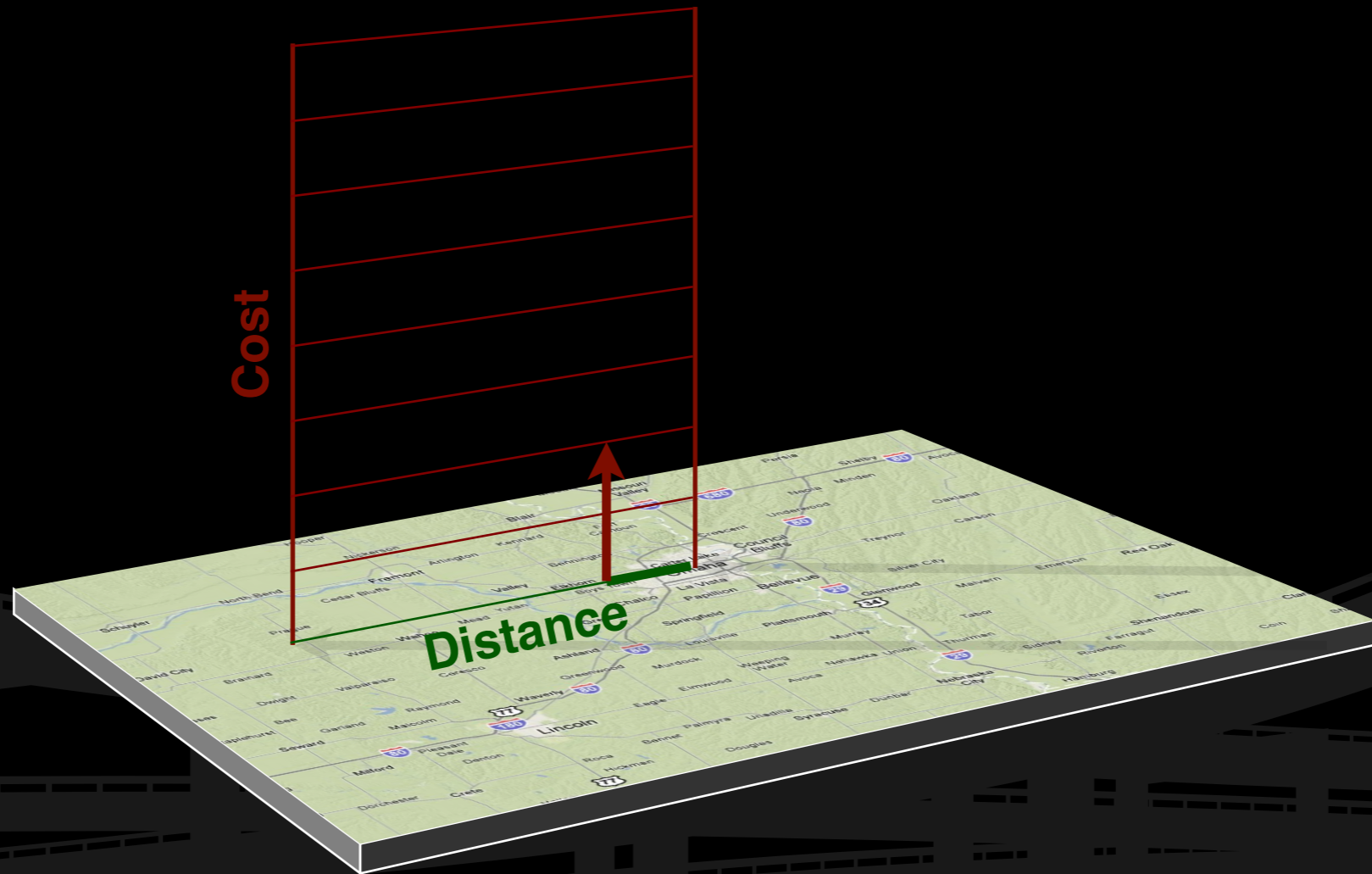


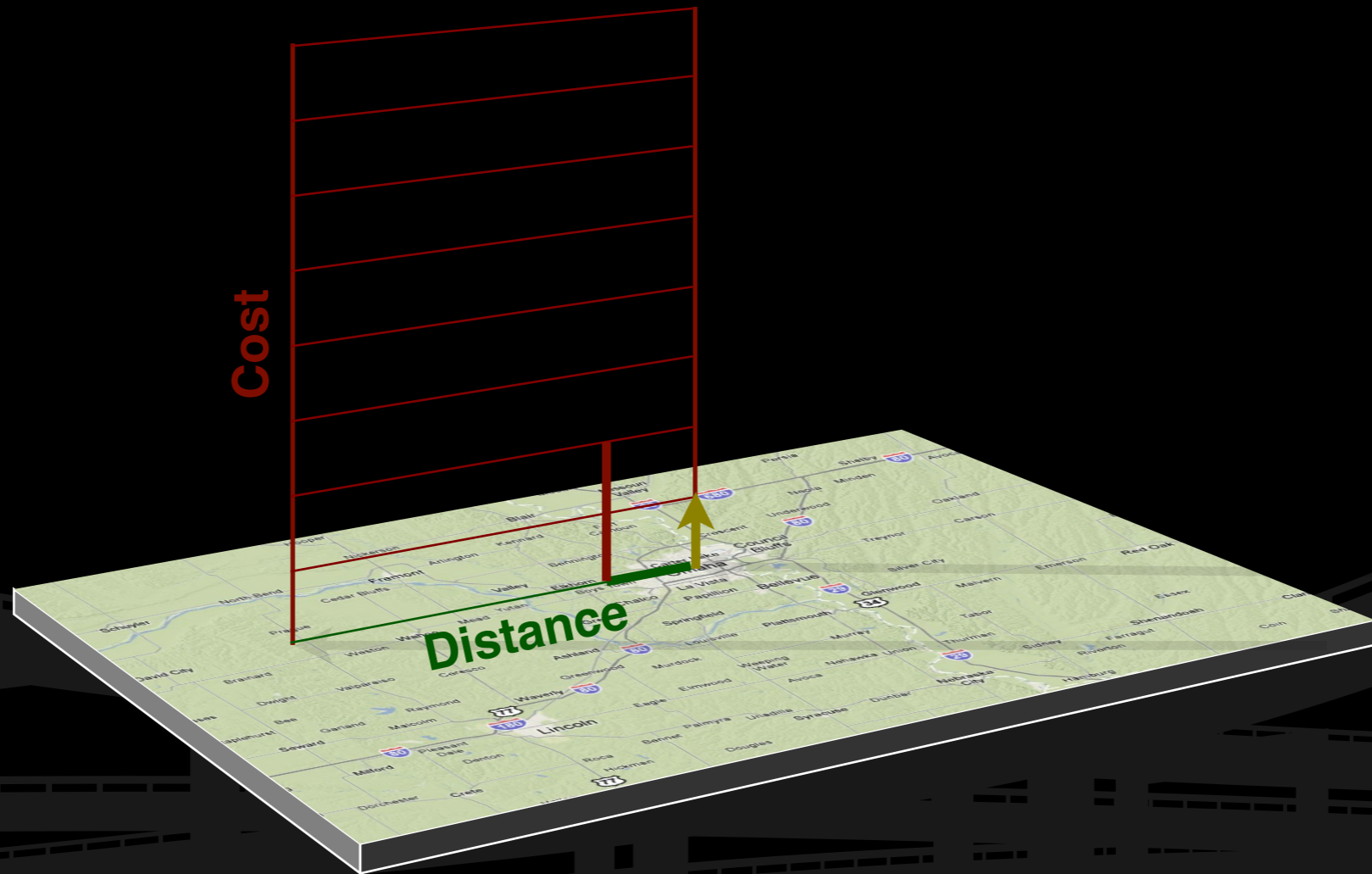


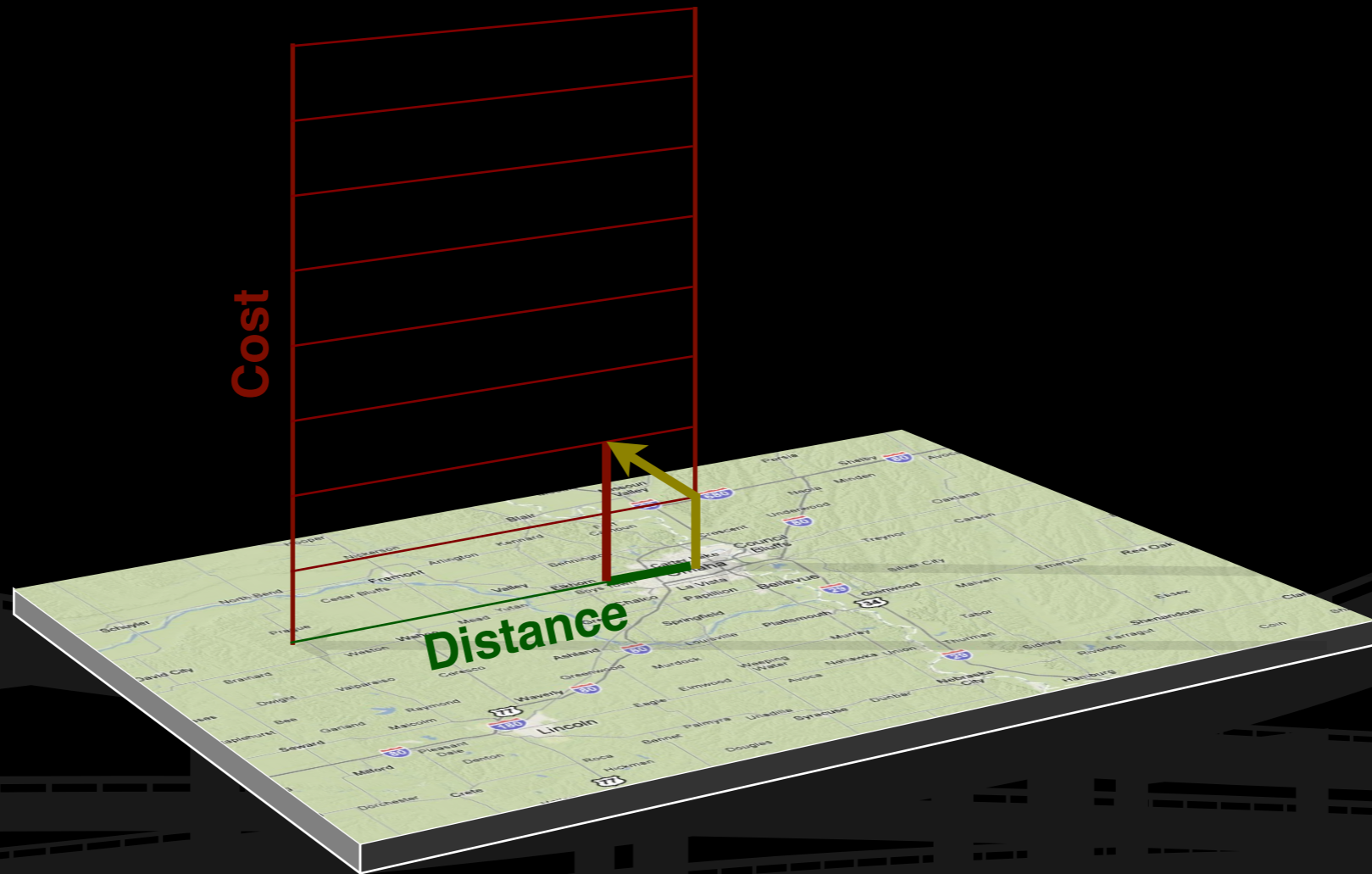


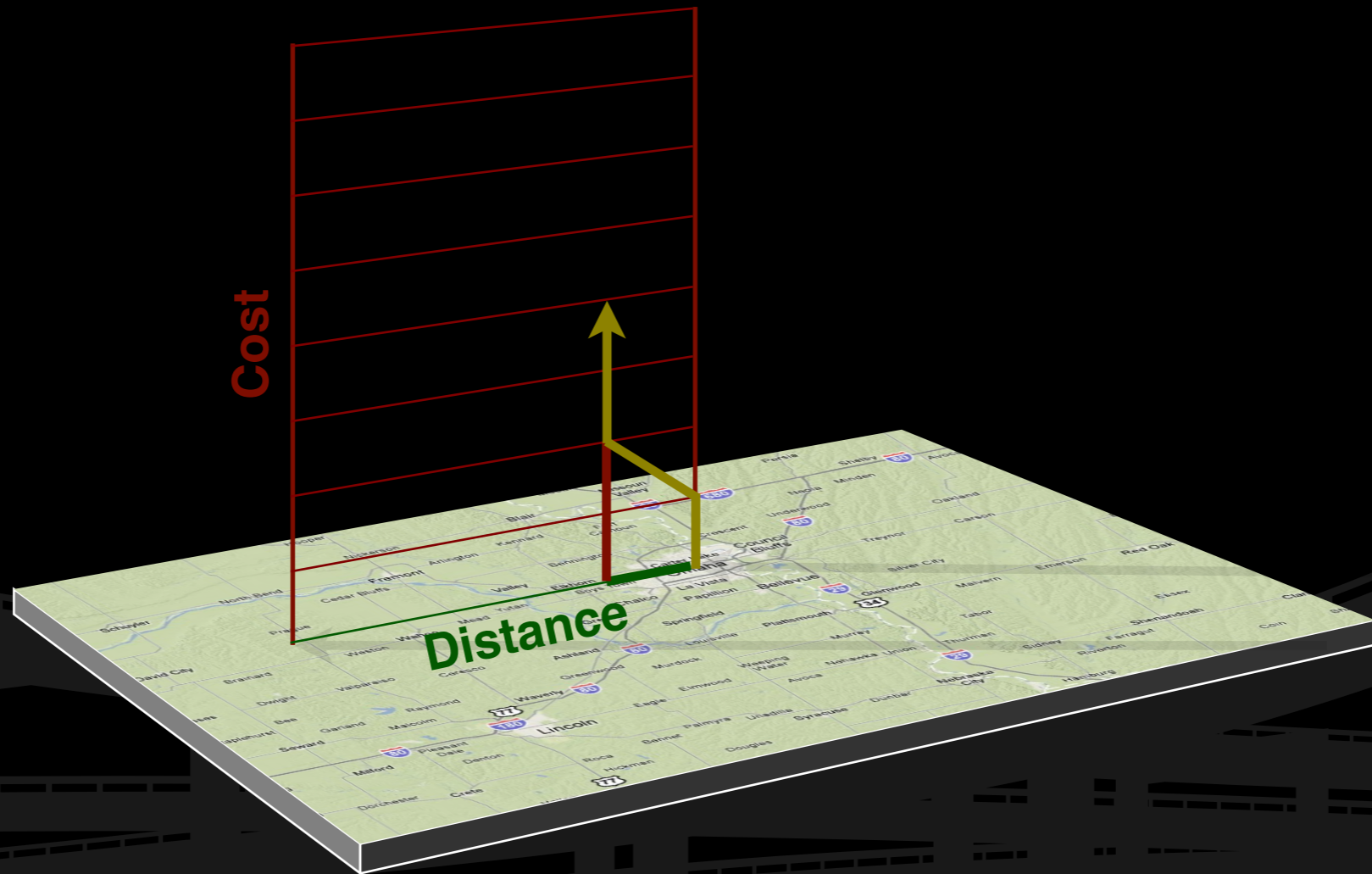


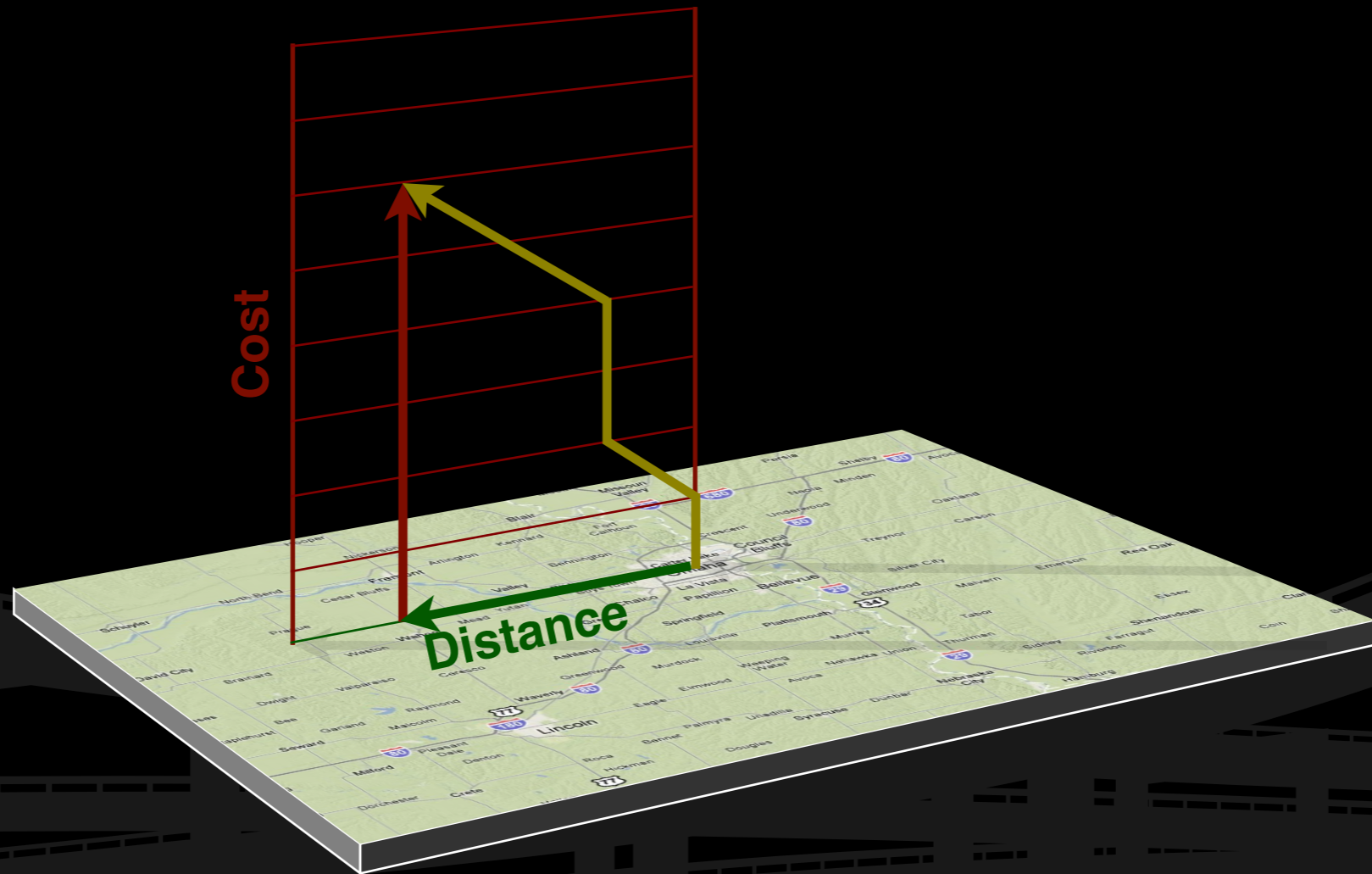


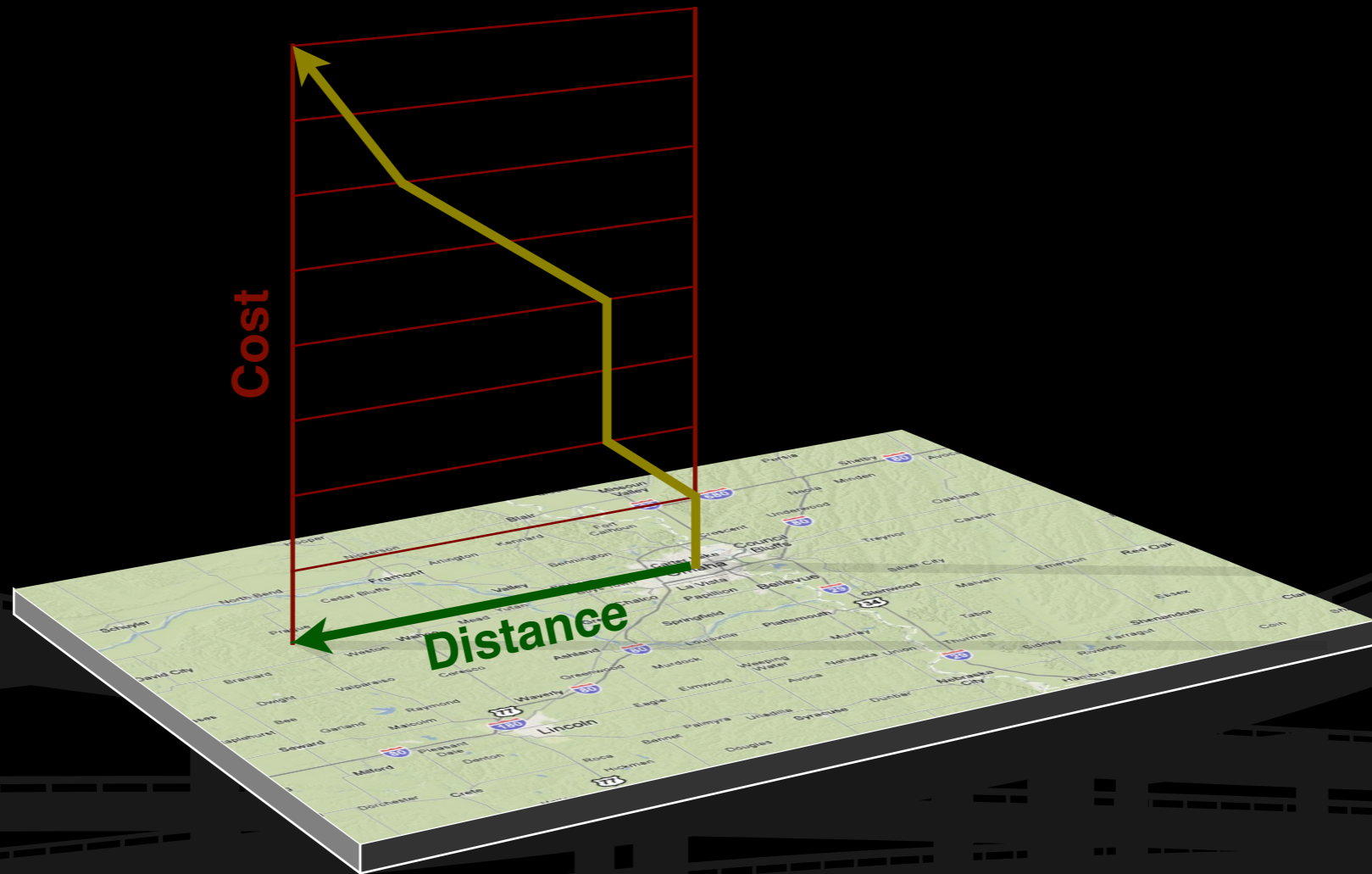


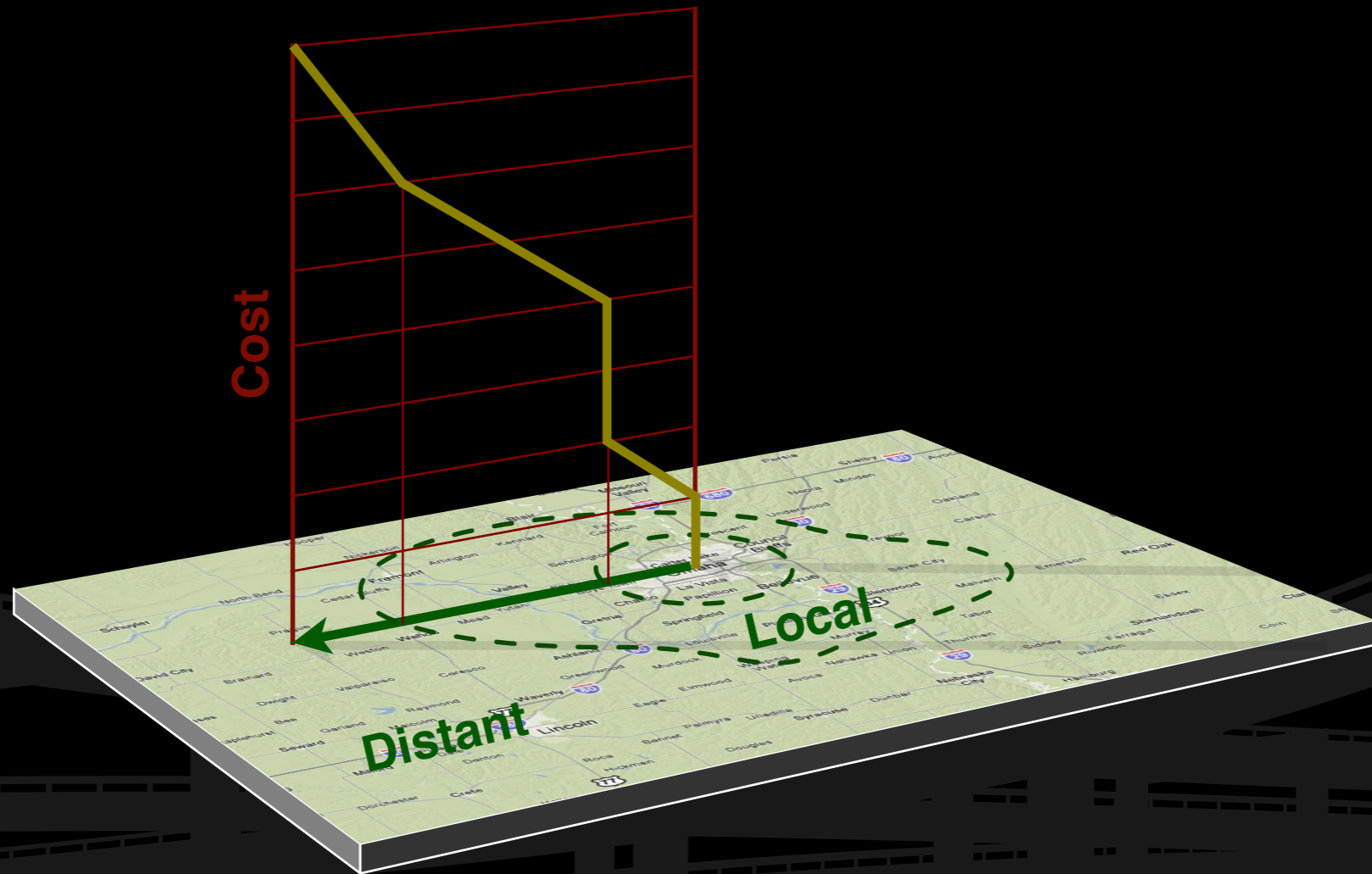


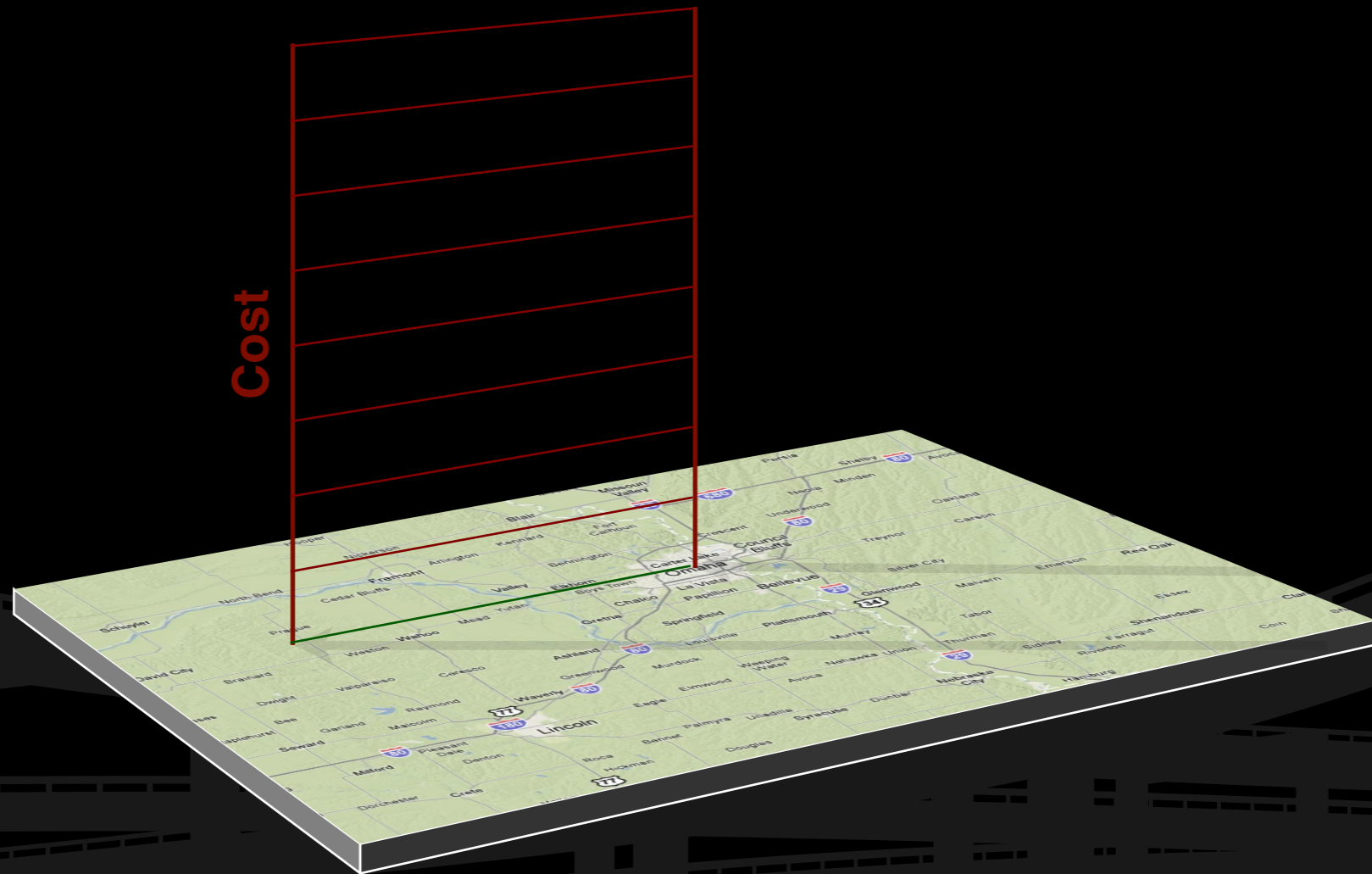










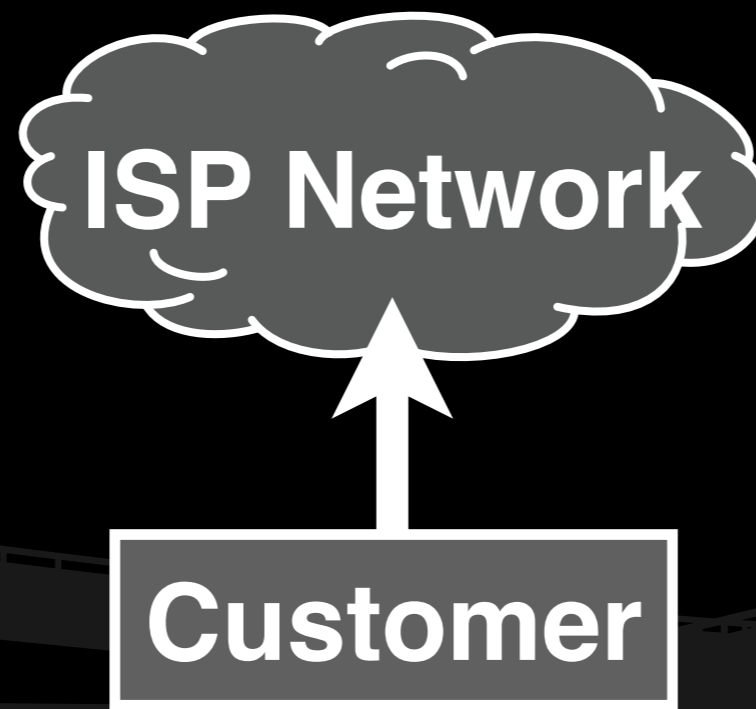


Flow Data for Routing Optimization

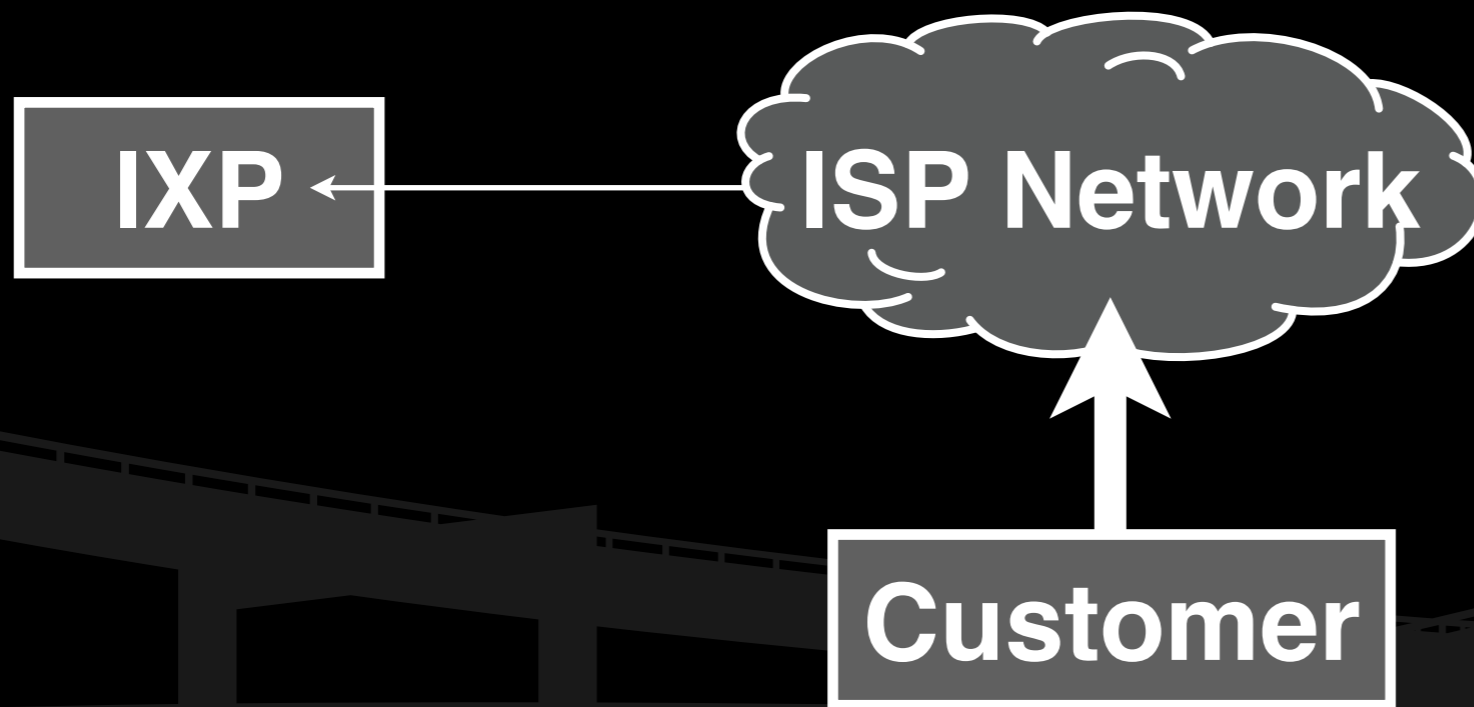
The problem:

Internet service providers have complex blends of customer types and customer traffic. They need to continuously reduce their APBDC to remain competitive, but generally try do so by guesswork, rather than by using the data available to them.

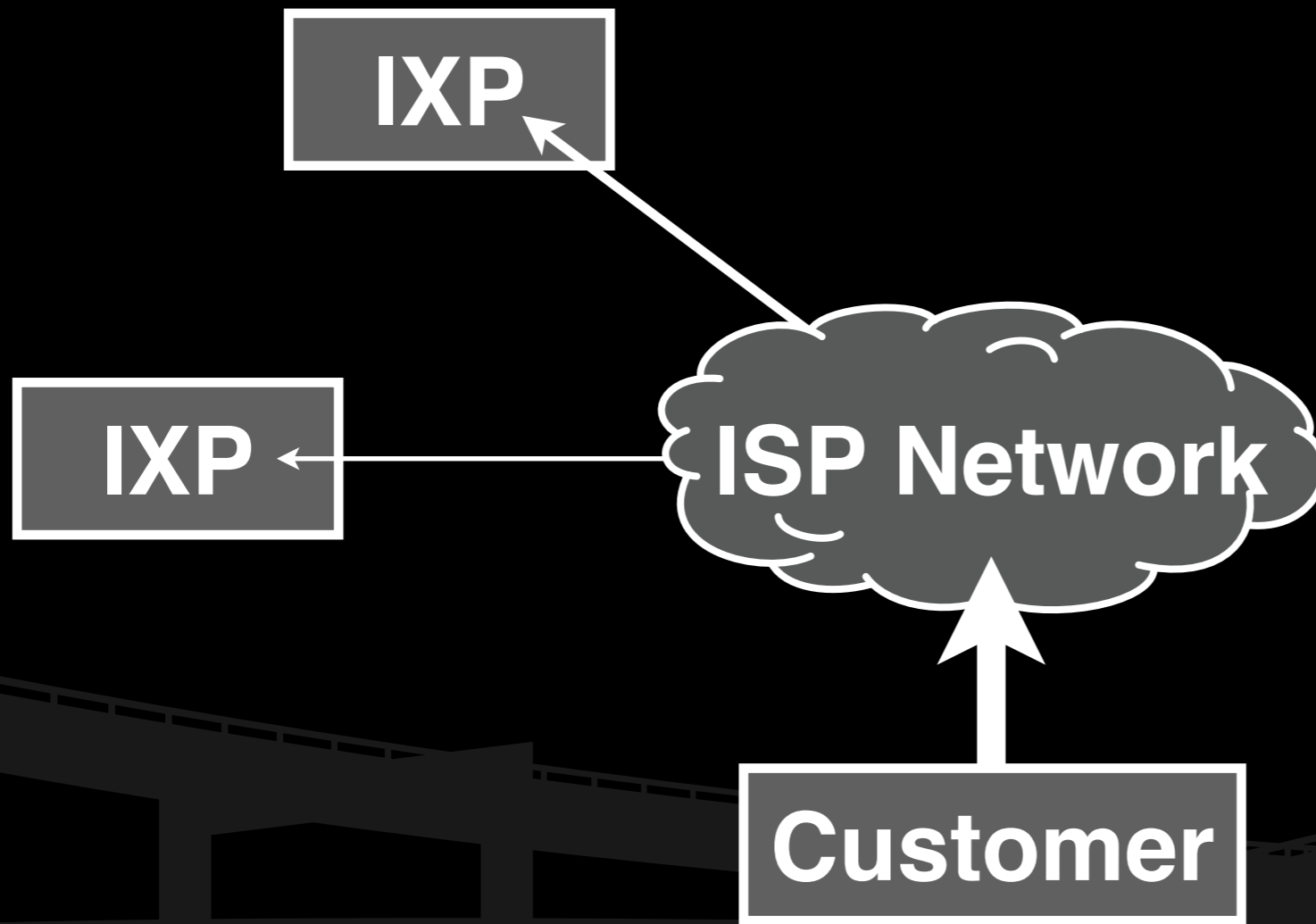
Flow Data for Routing Optimization



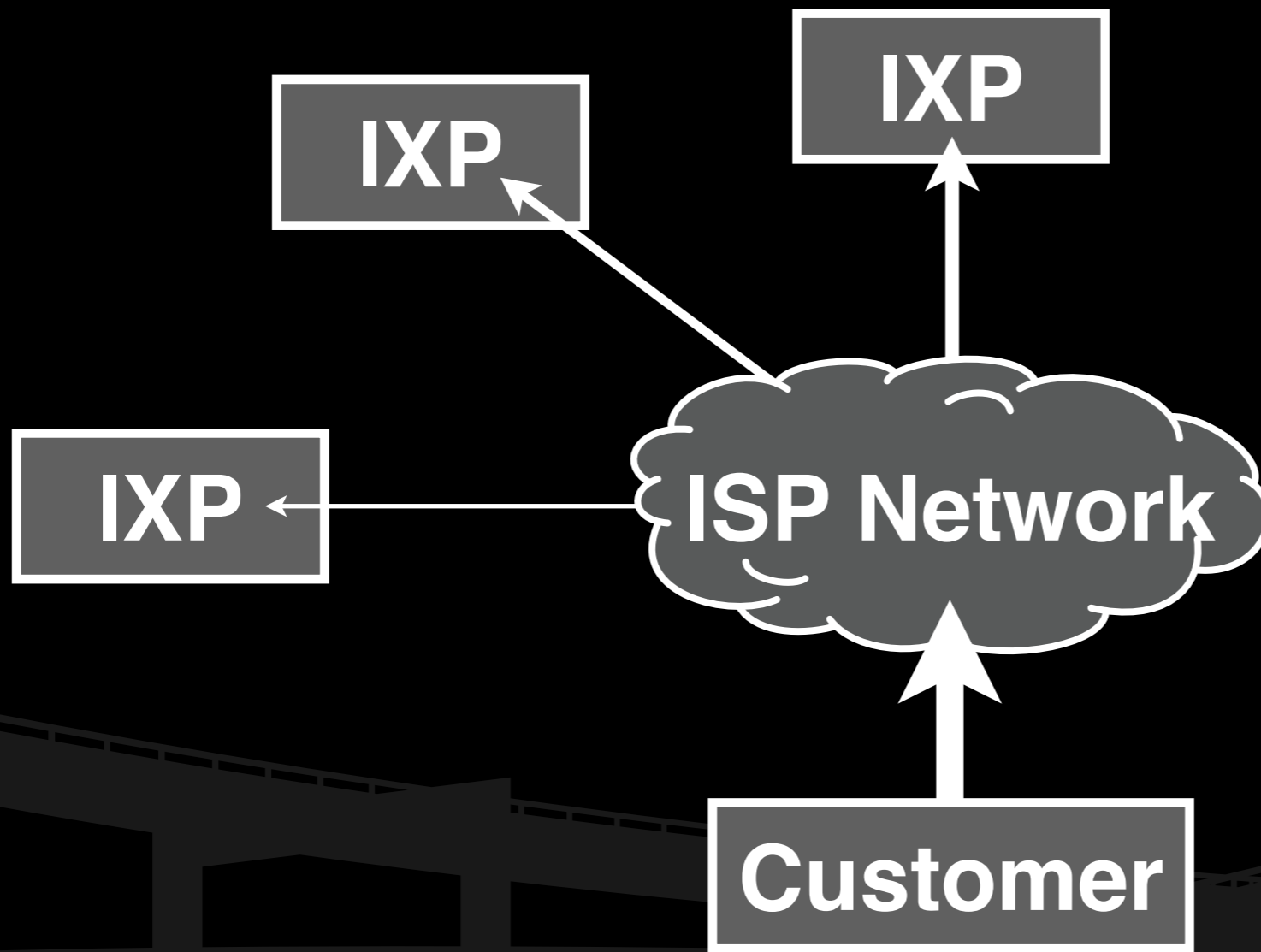
Flow Data for Routing Optimization



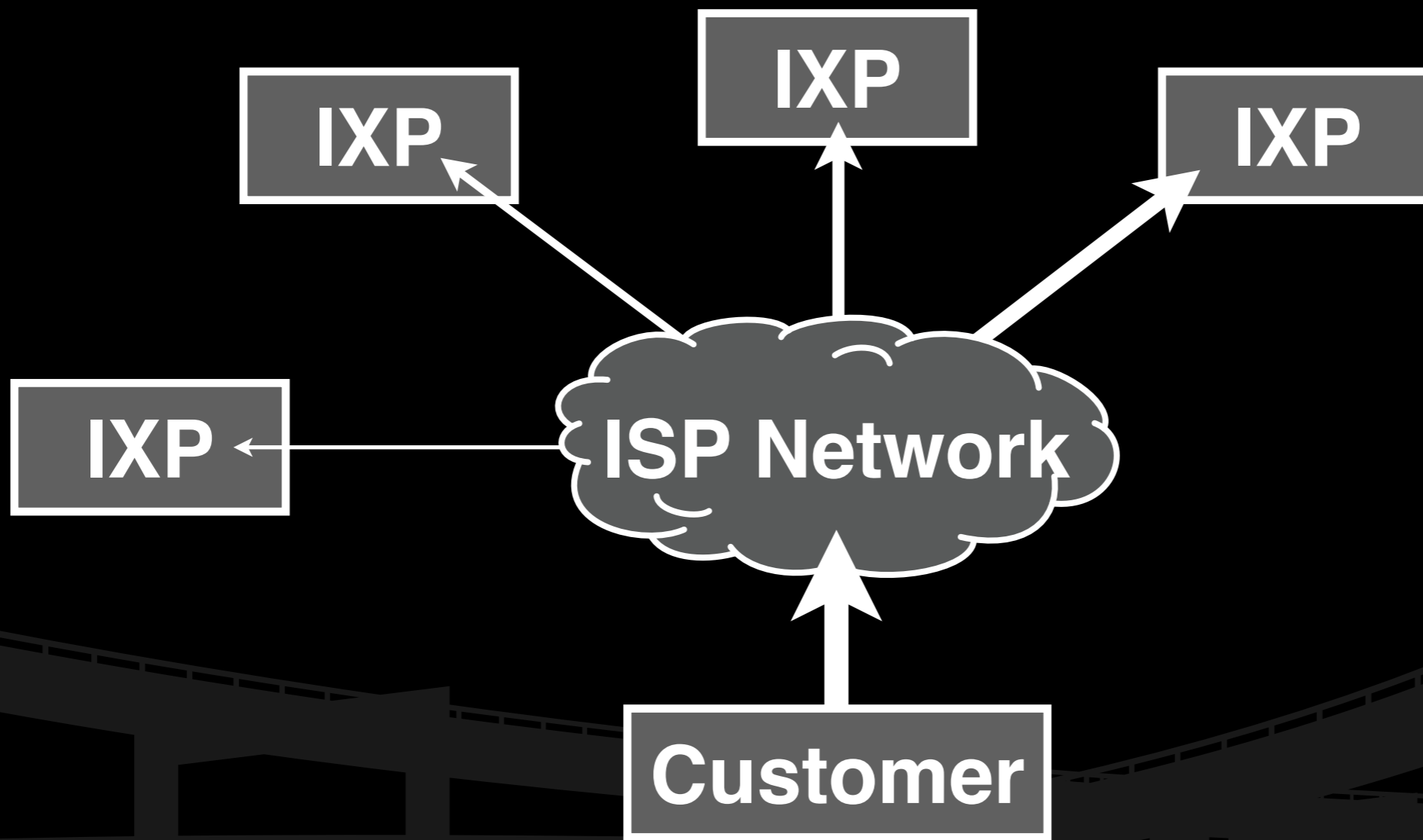
Flow Data for Routing Optimization



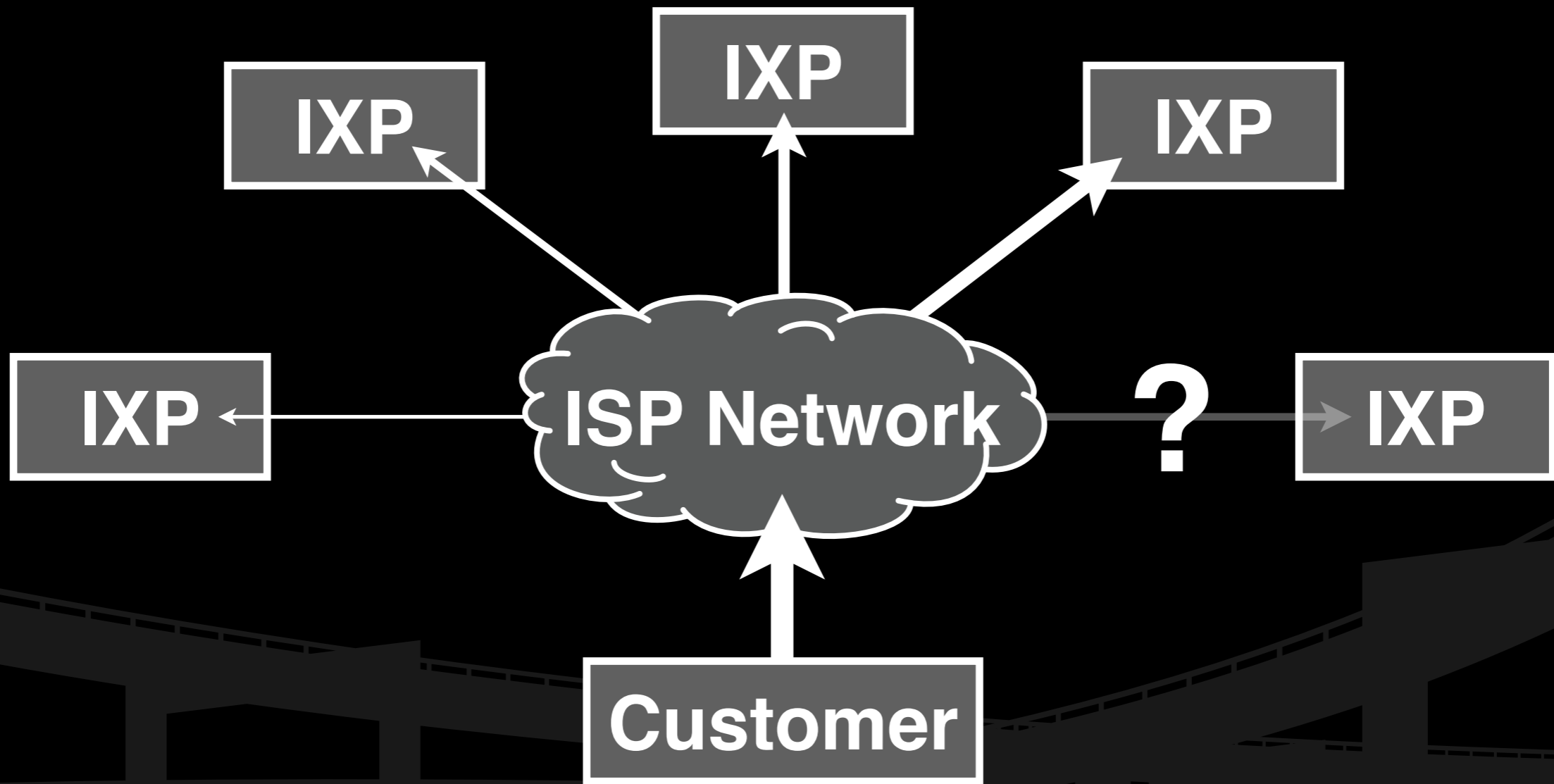
Flow Data for Routing Optimization



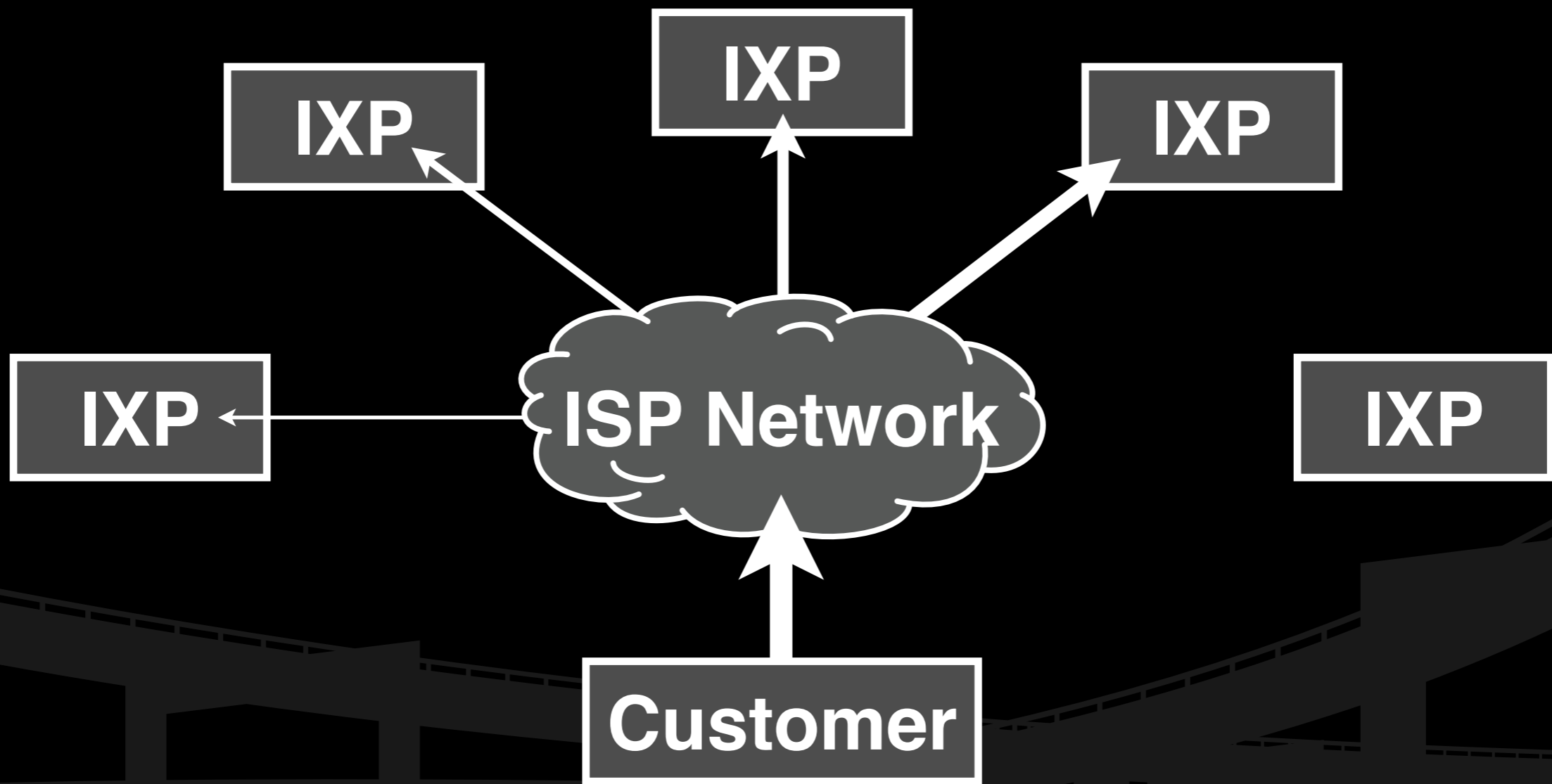
Flow Data for Routing Optimization



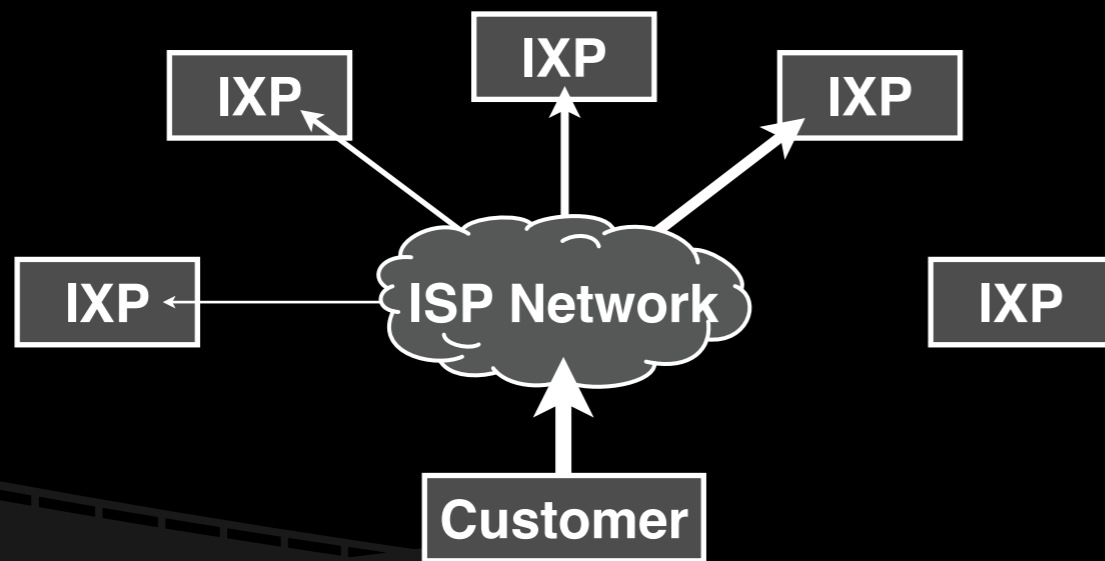
Flow Data for Routing Optimization



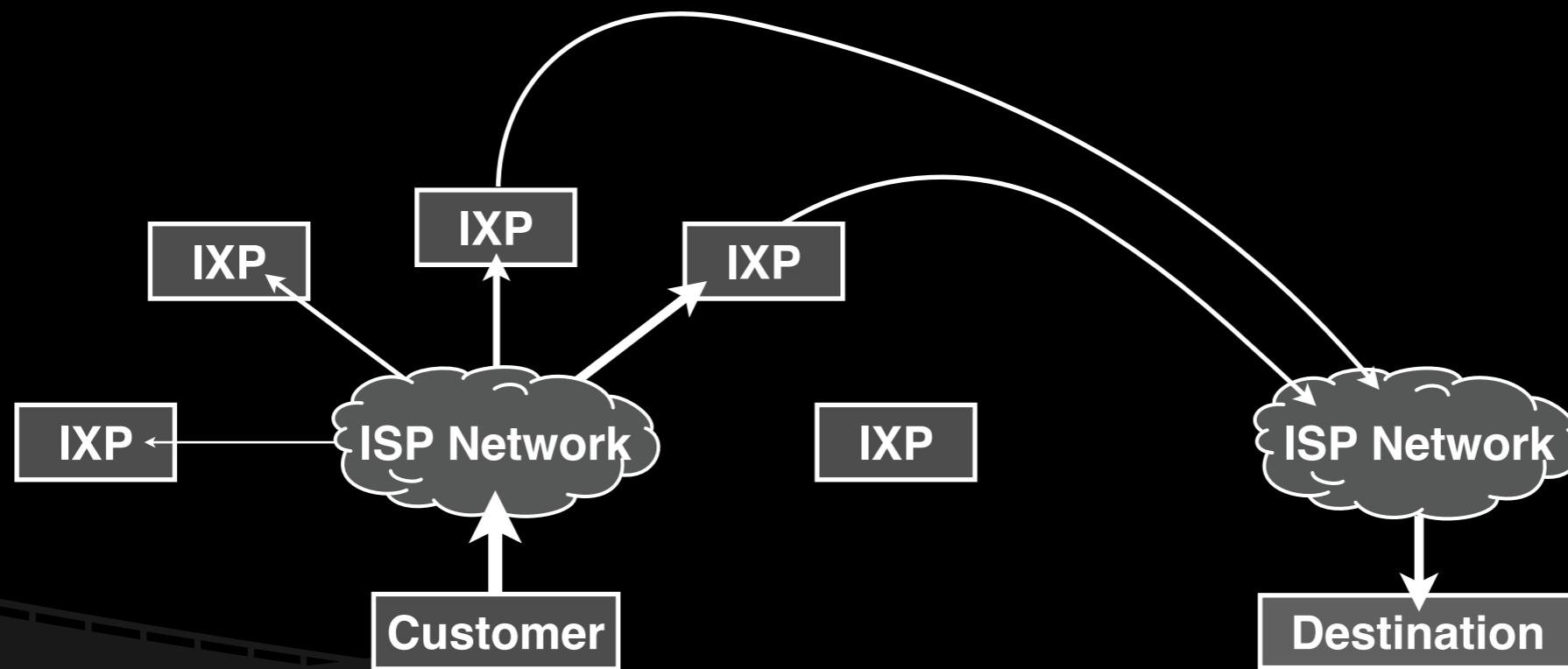
Flow Data for Routing Optimization



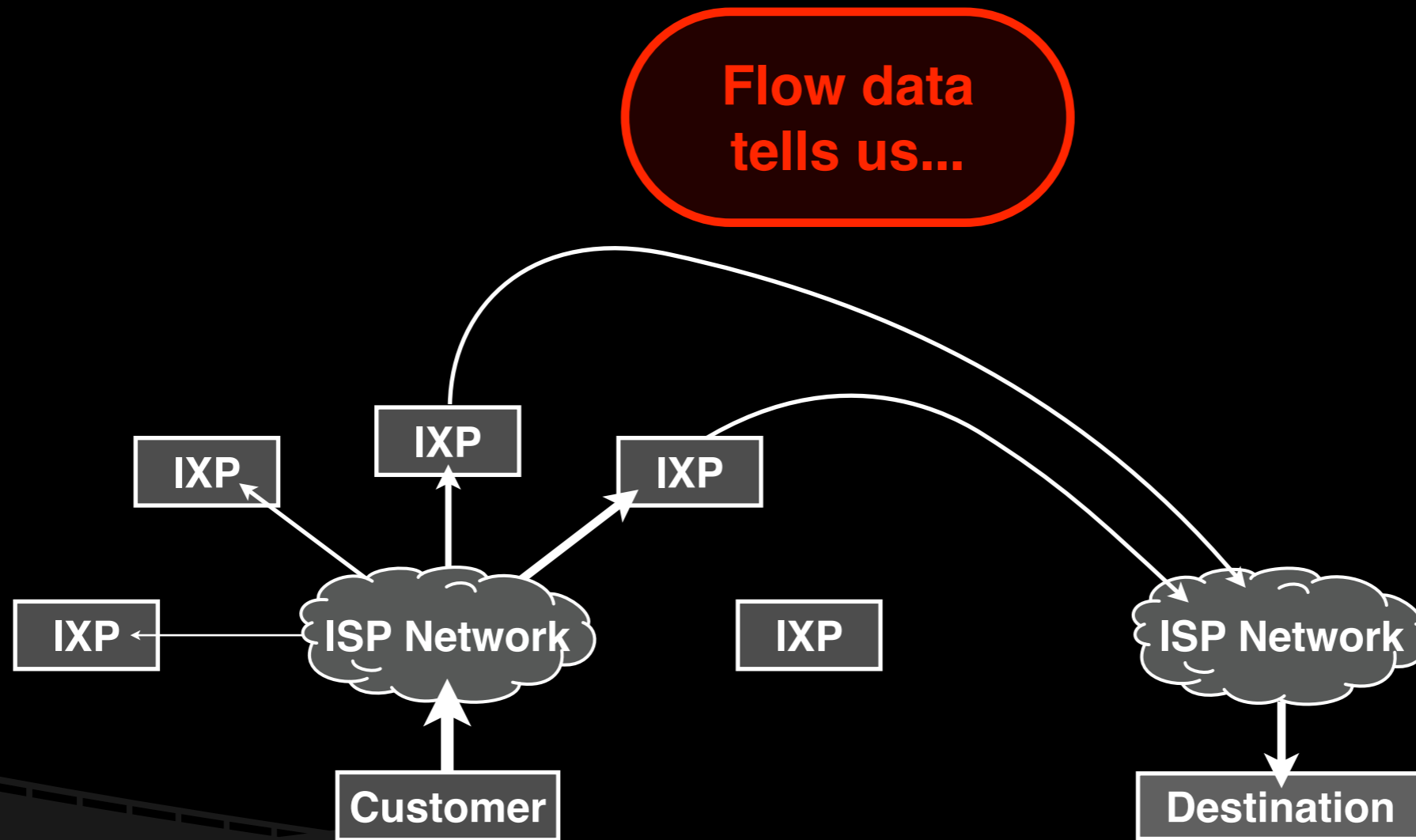
Flow Data for Routing Optimization



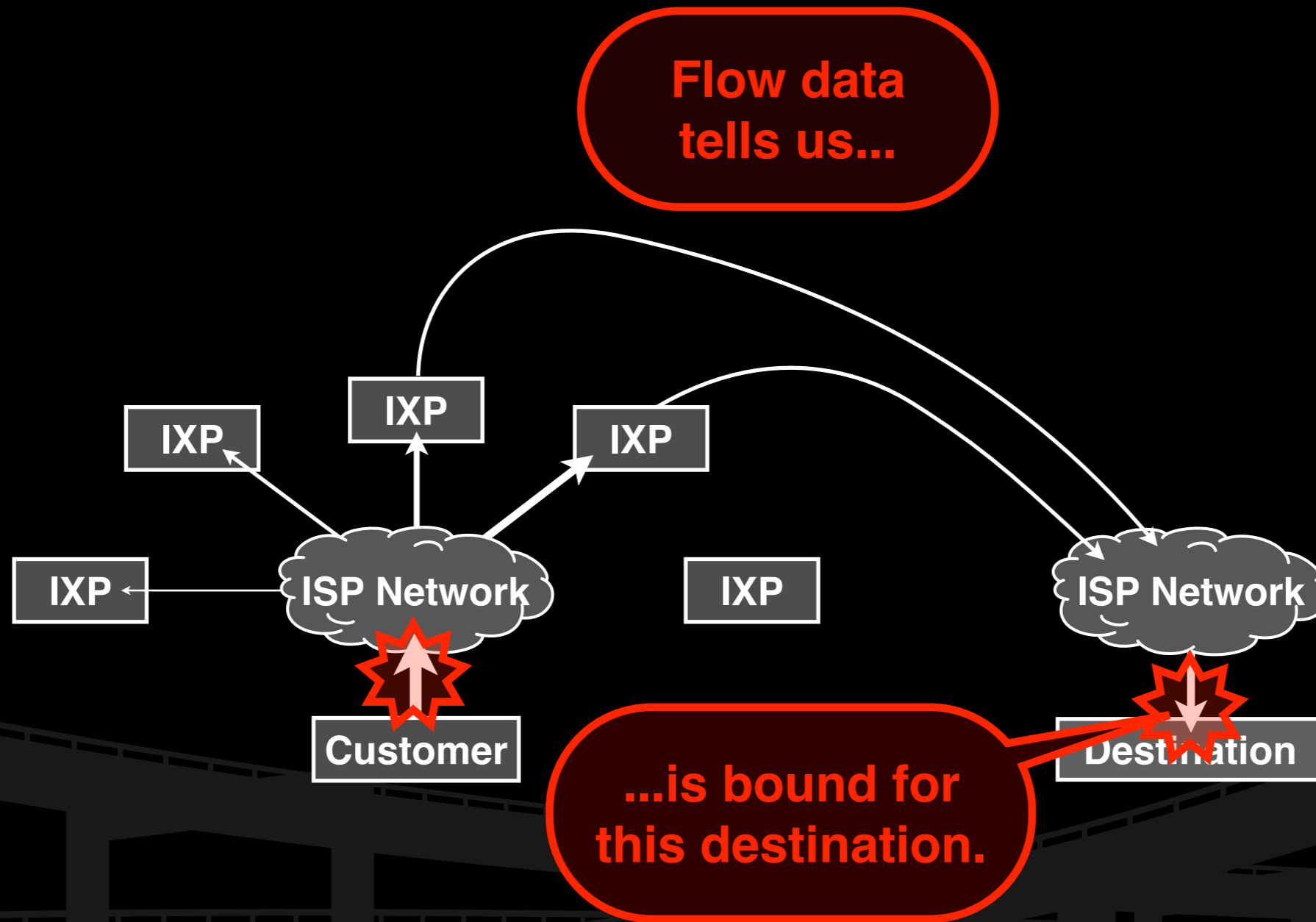
Flow Data for Routing Optimization



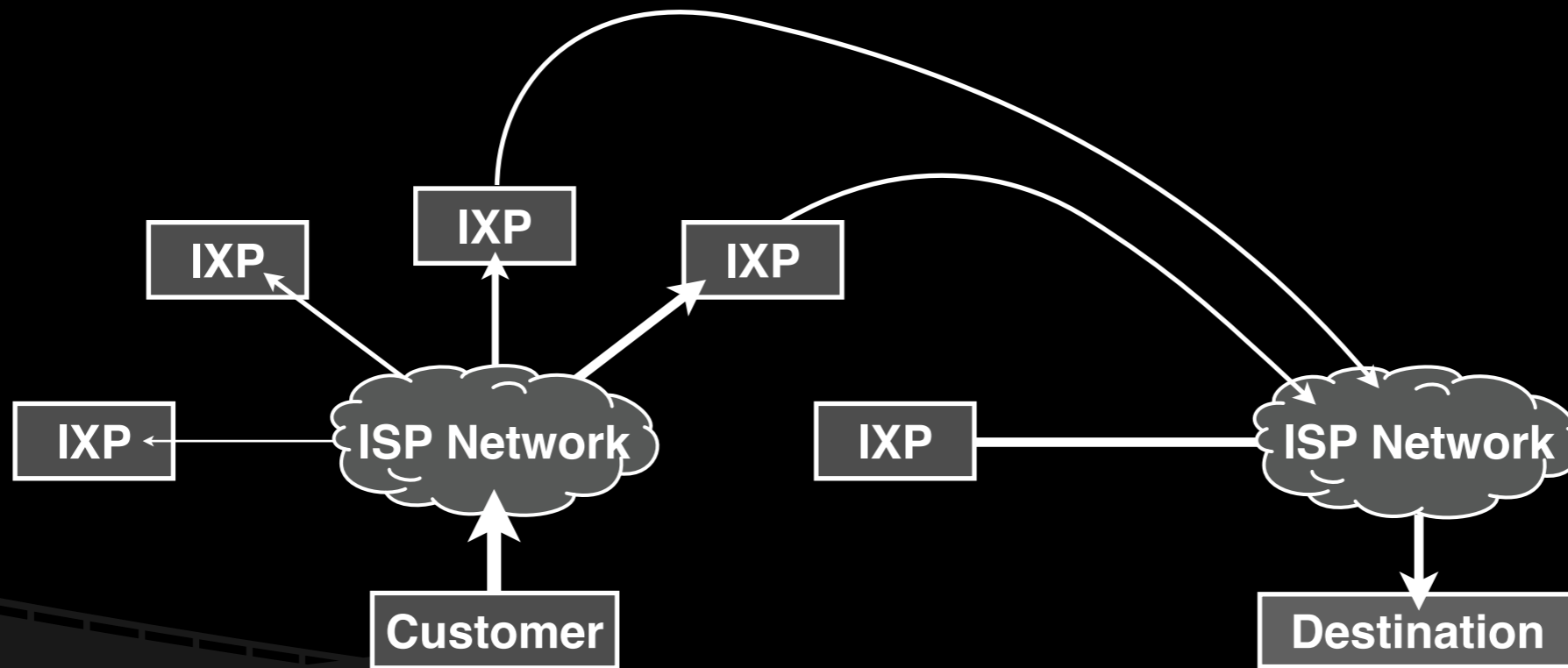
Flow Data for Routing Optimization



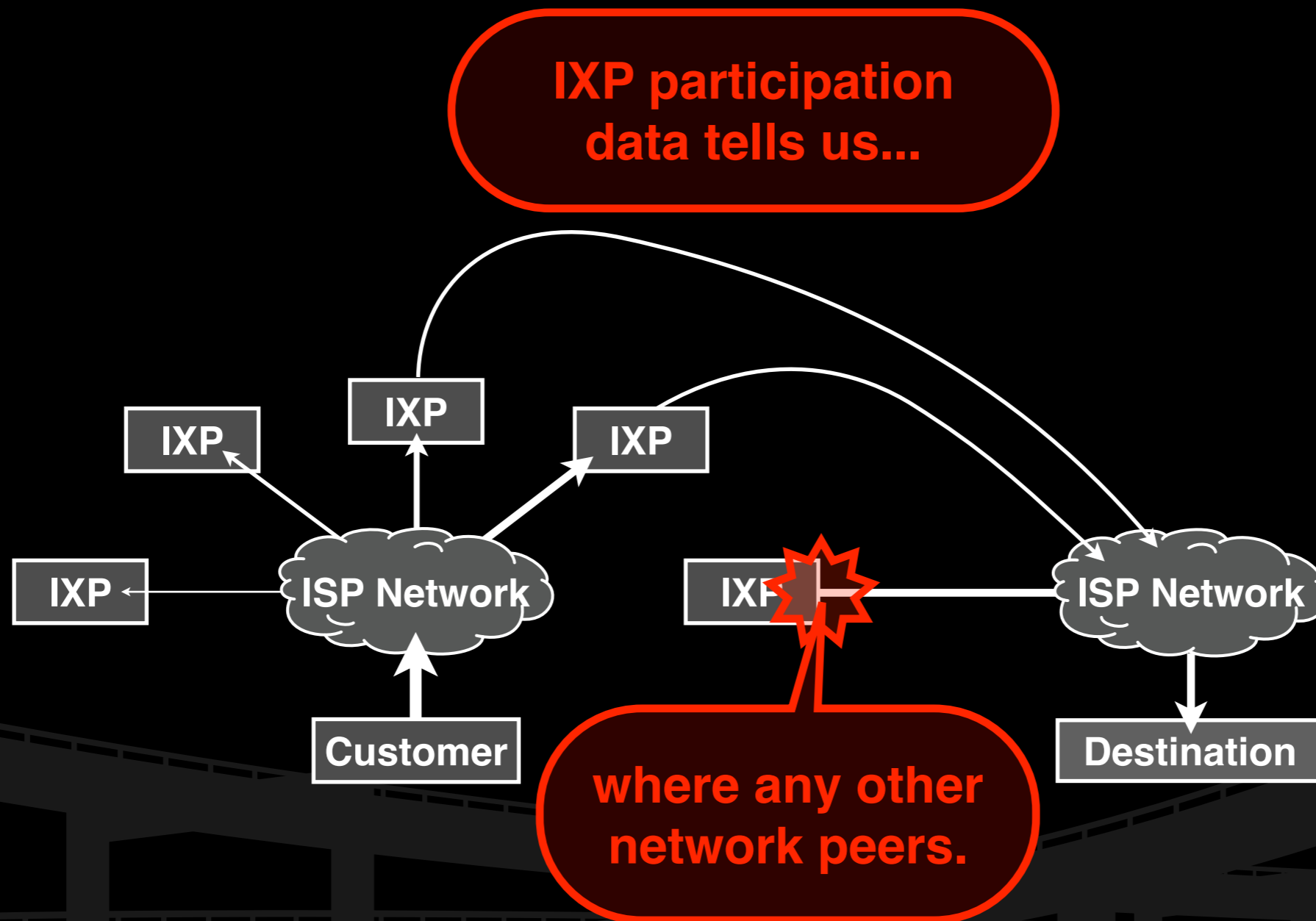
Flow Data for Routing Optimization



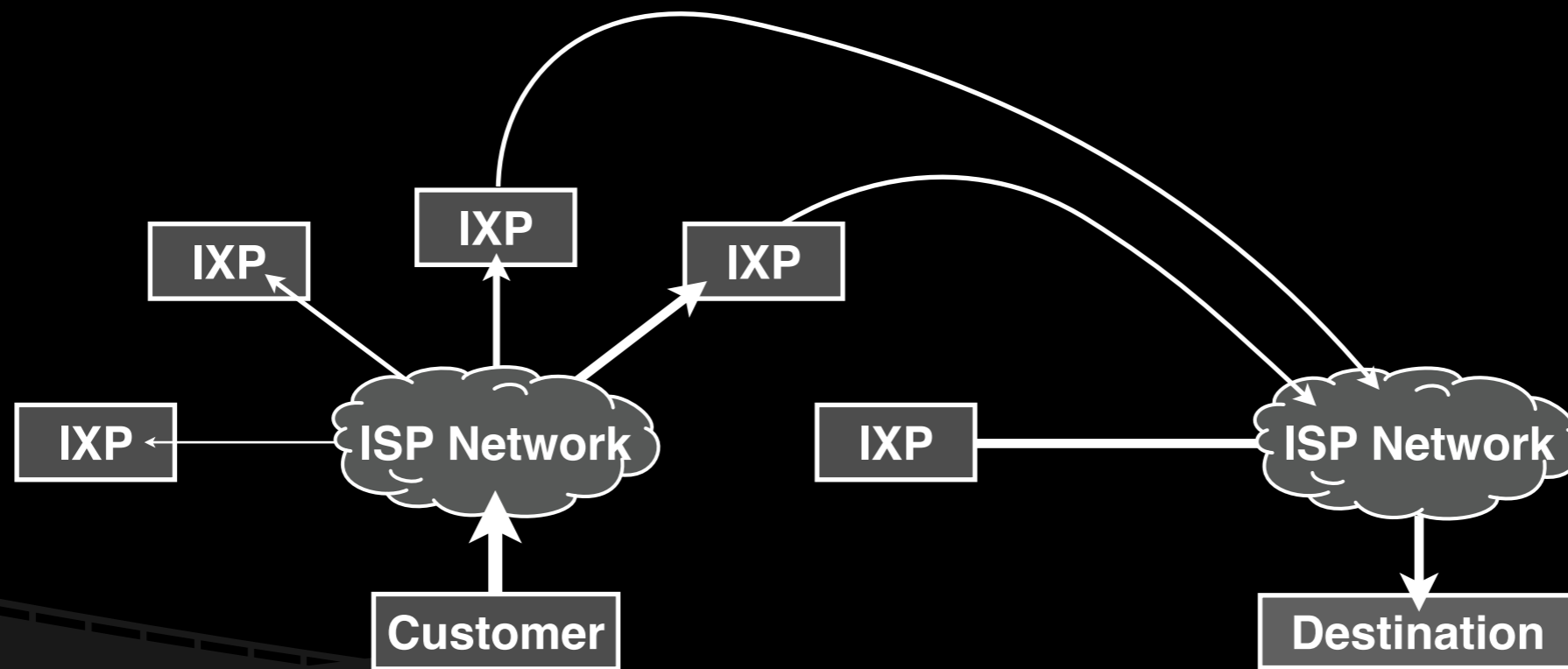
Flow Data for Routing Optimization



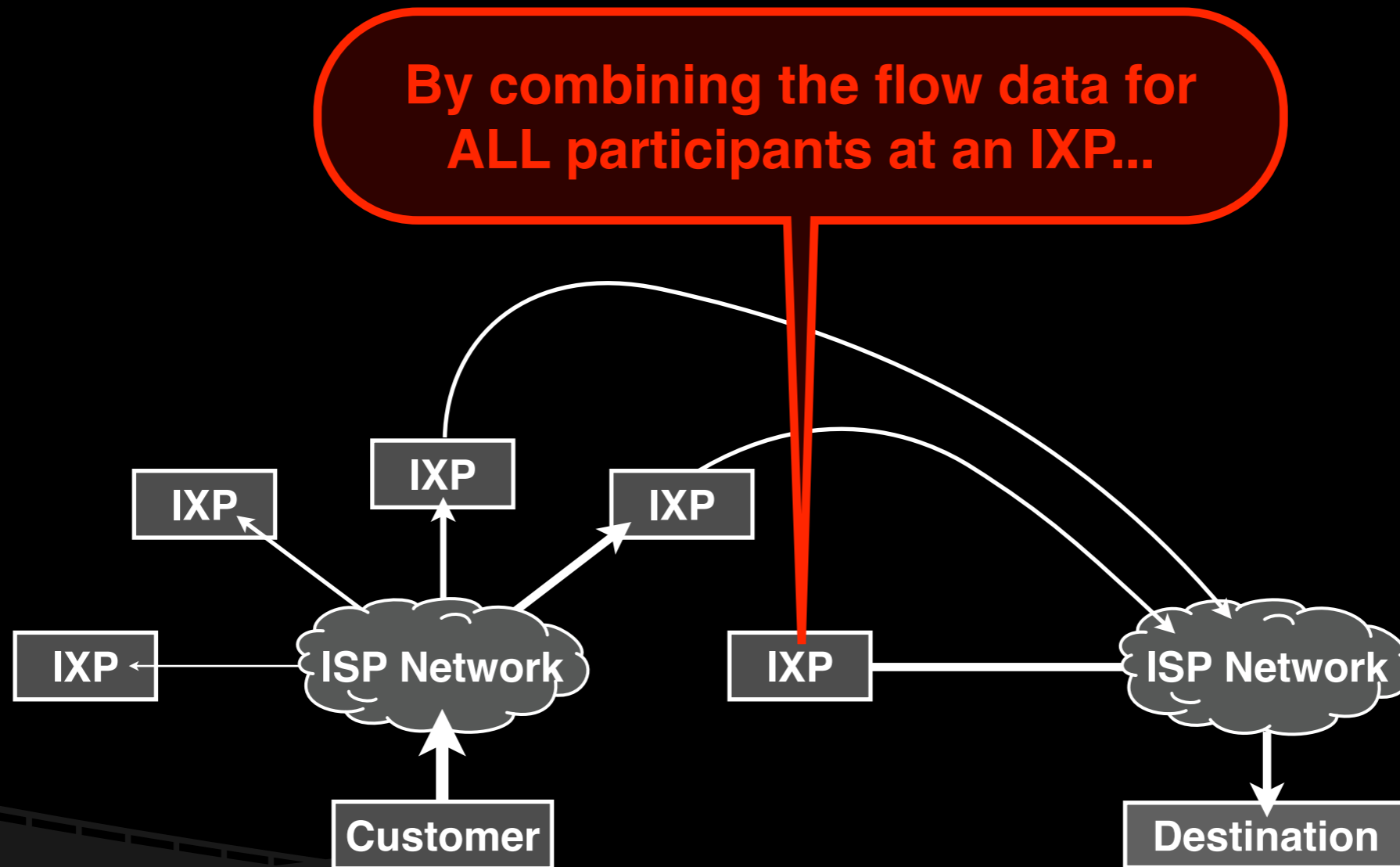
Flow Data for Routing Optimization



Flow Data for Routing Optimization

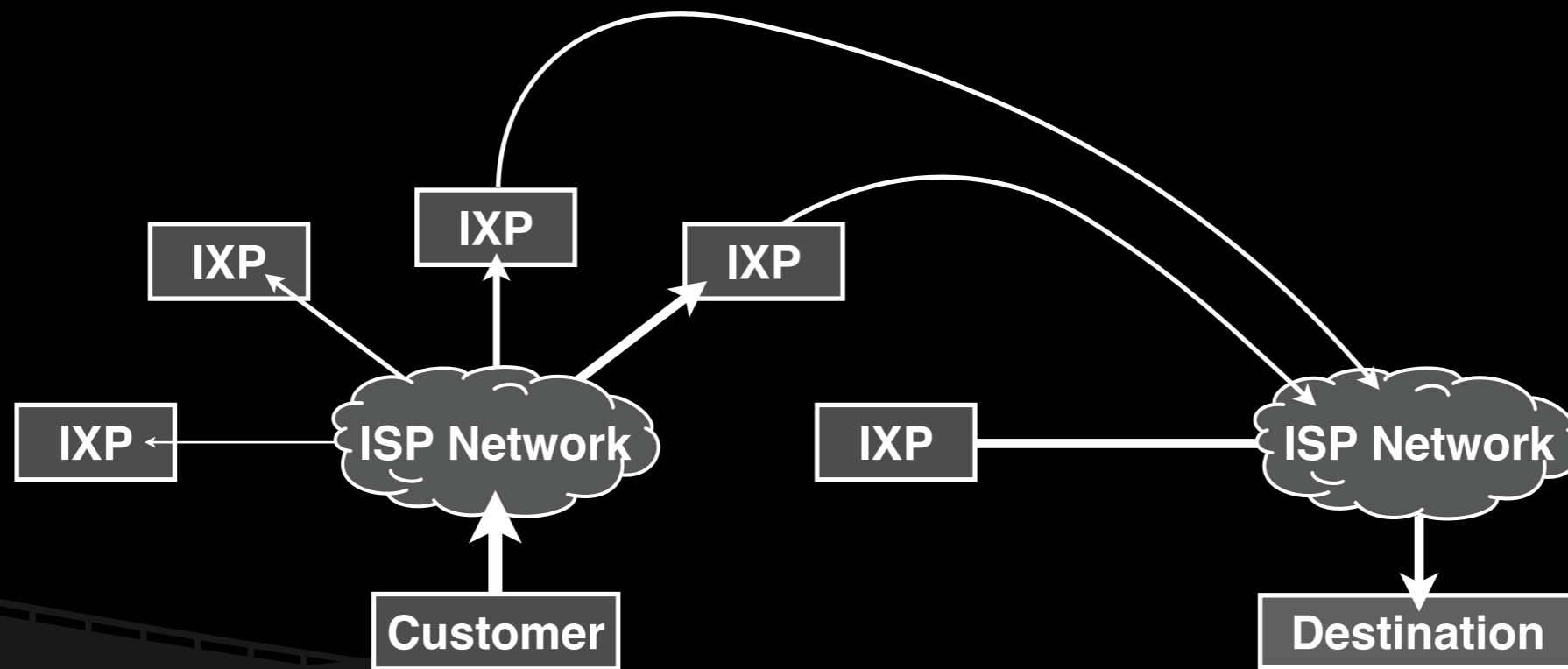


Flow Data for Routing Optimization



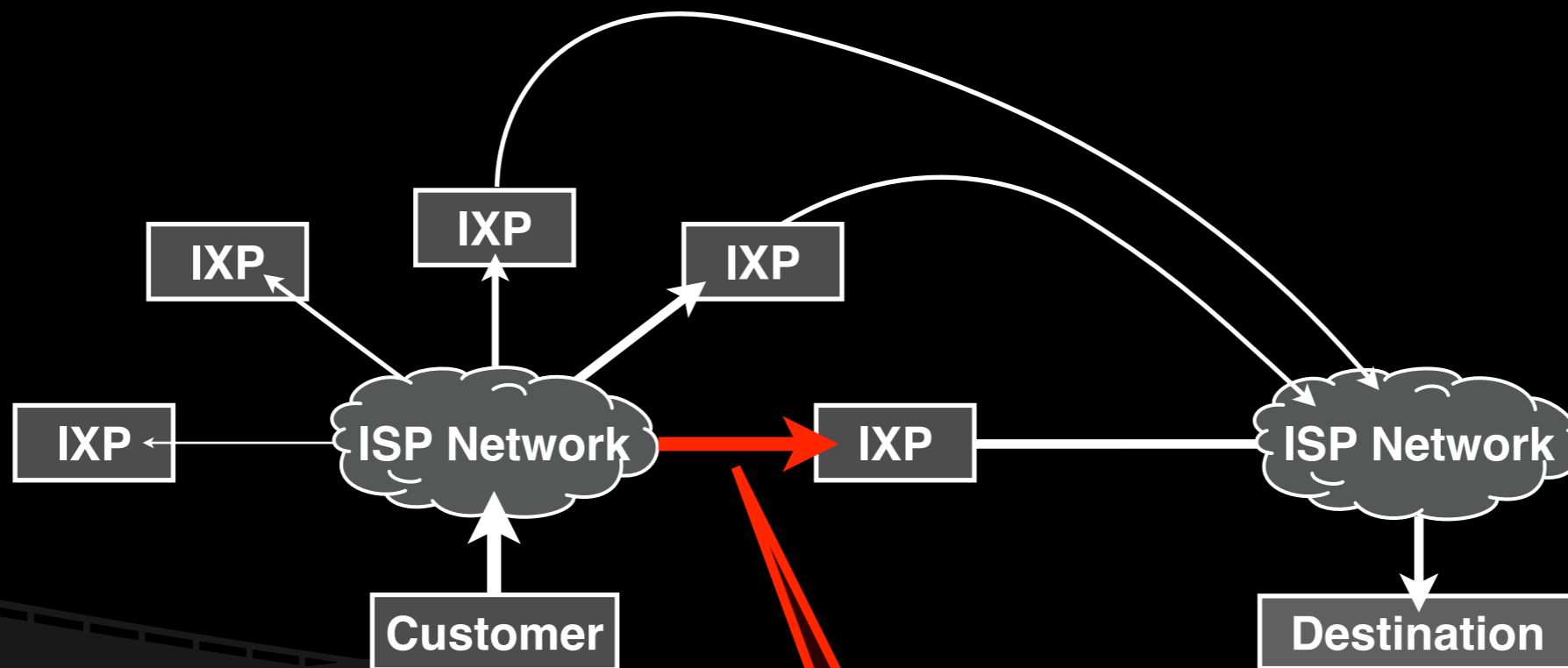
...with the routing table changes we'd see if we peered there...

Flow Data for Routing Optimization



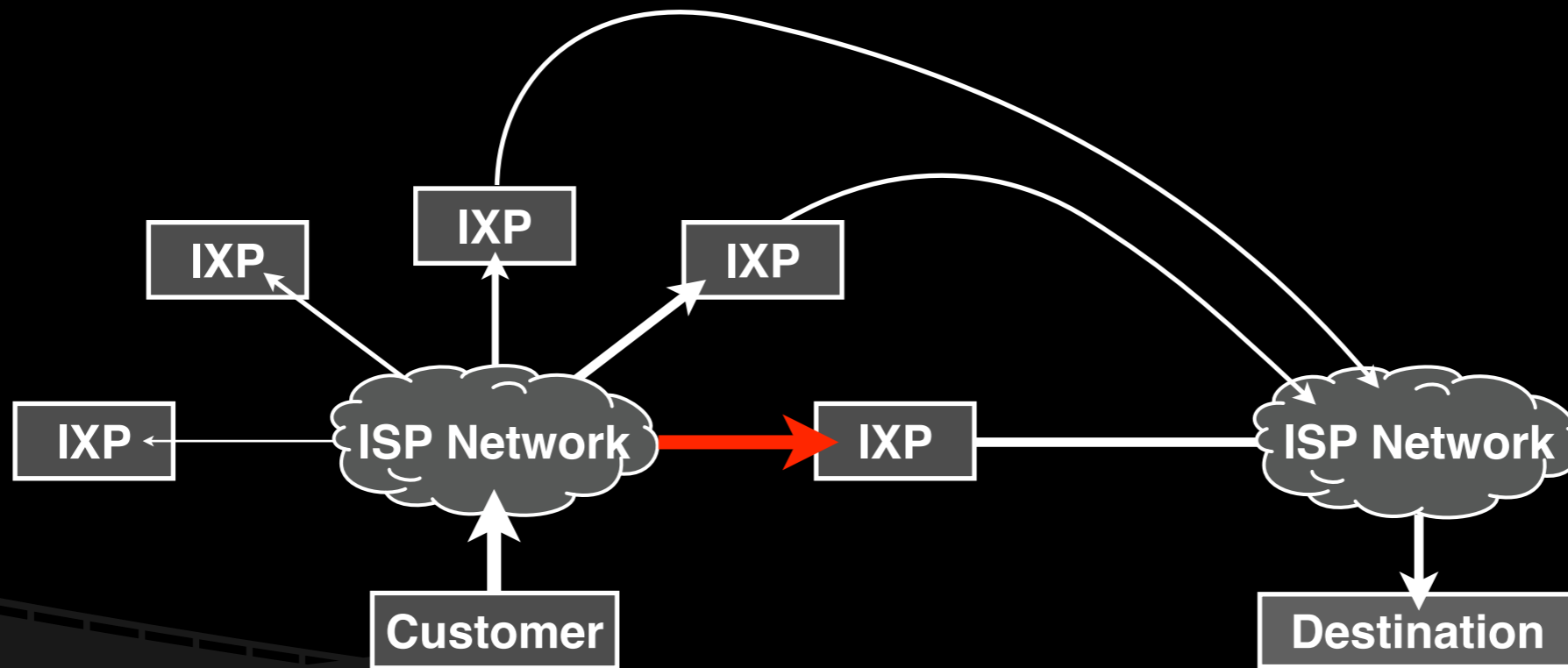
Flow Data for Routing Optimization

We can tell what portion of our traffic...



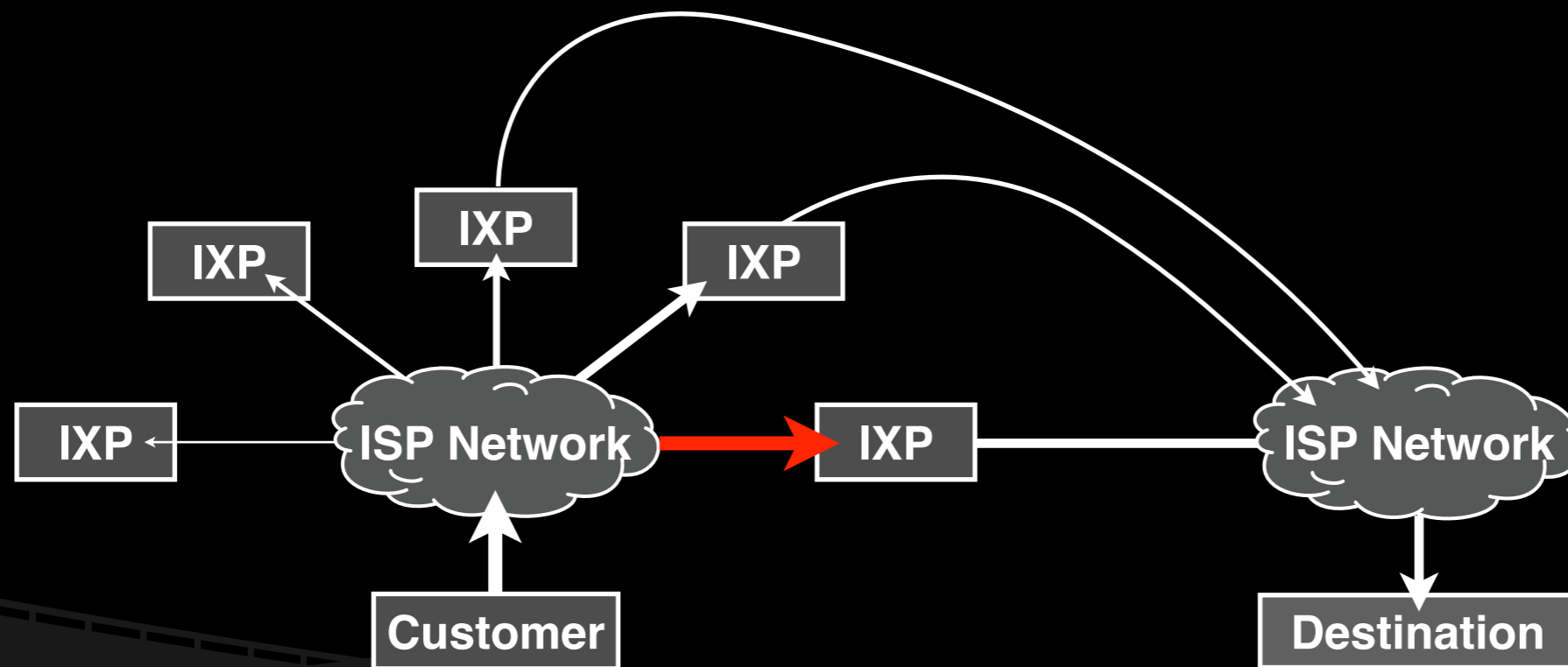
...would flow across this link, if it existed.

Flow Data for Routing Optimization



Flow Data for Routing Optimization

Combining that with the projected cost of reaching the IXP...



...allows us to calculate the new APBDC that would obtain.

Flow Data is a Tempting Target

The problem:

With all the neat tricks you can do with flow data, it's becoming a more and more tempting target for people who want to analyze user behavior.

Thanks, and Questions?

Bill Woodcock
Research Director
Packet Clearing House
woody@pch.net