

# TeleGeography Workshop

PTC

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# Pricing Update

Michael Bisaha  
TeleGeography

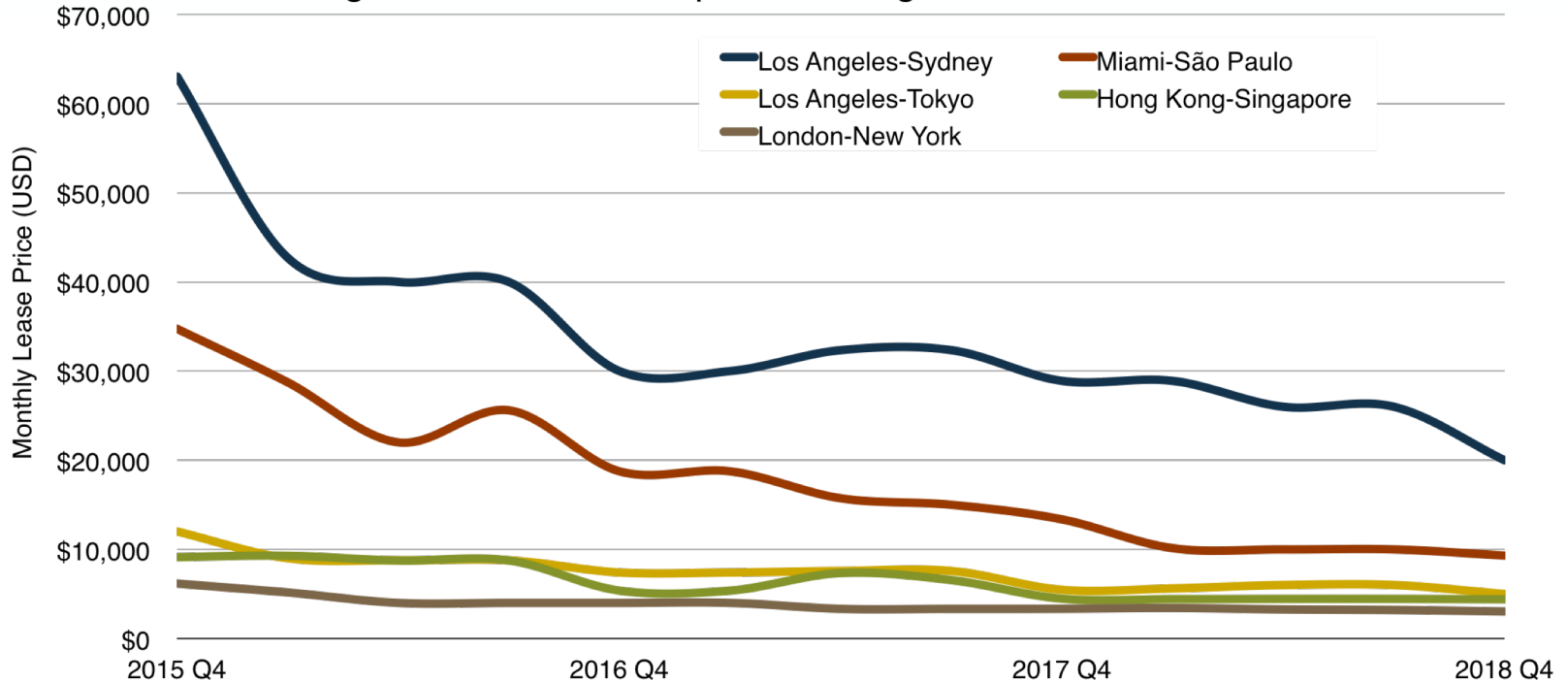
# Overview

- Baseline wholesale pricing trends
  - Where are we, and how did we get here?
- IP transit hubs maintaining their primacy
  - Are any new hubs ready to join the club?
- New cable pricing: If you build it, they will come (down)
  - Are all new cables alike?
  - What is the “new cable” effect on transport pricing, on various route types

# Setting the Stage

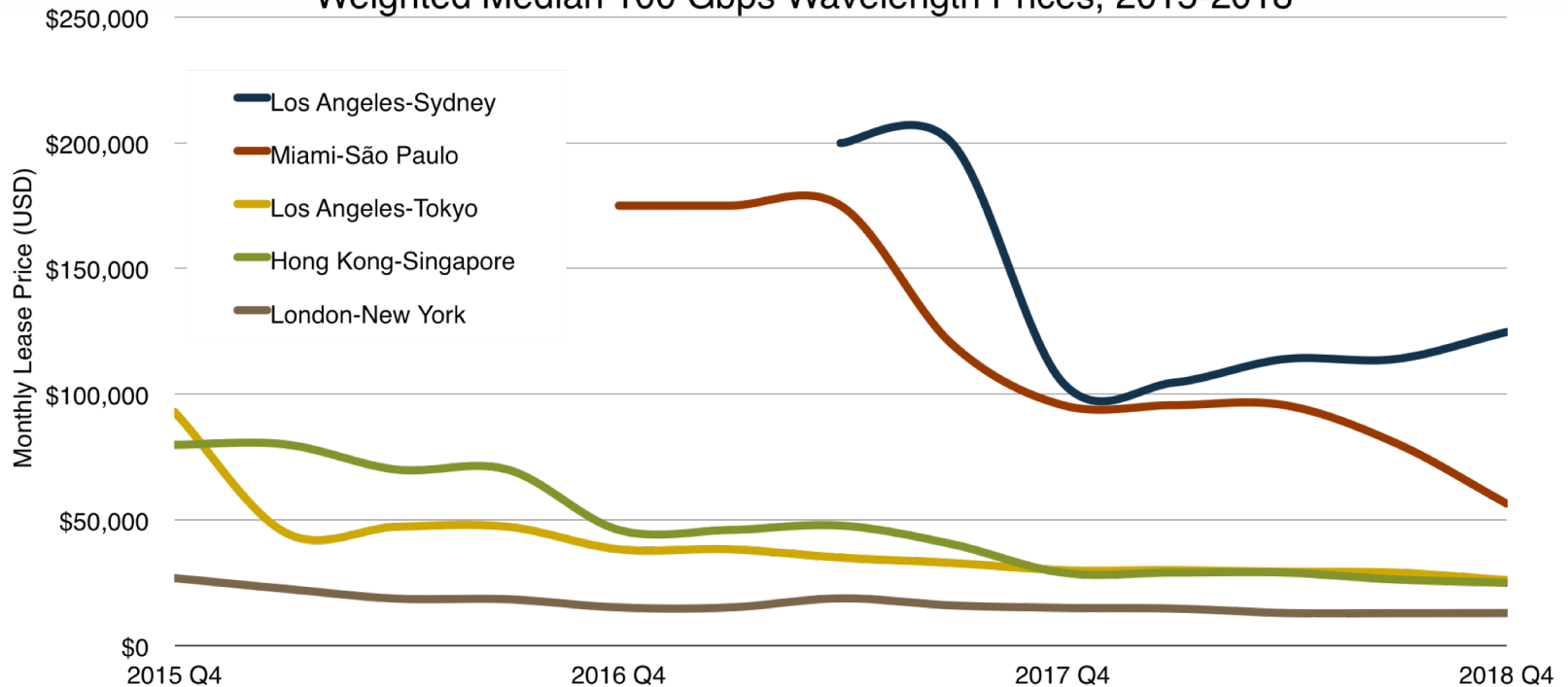
# 10G Wavelength Pricing

## Weighted Median 10 Gbps Wavelength Prices, 2015-2018



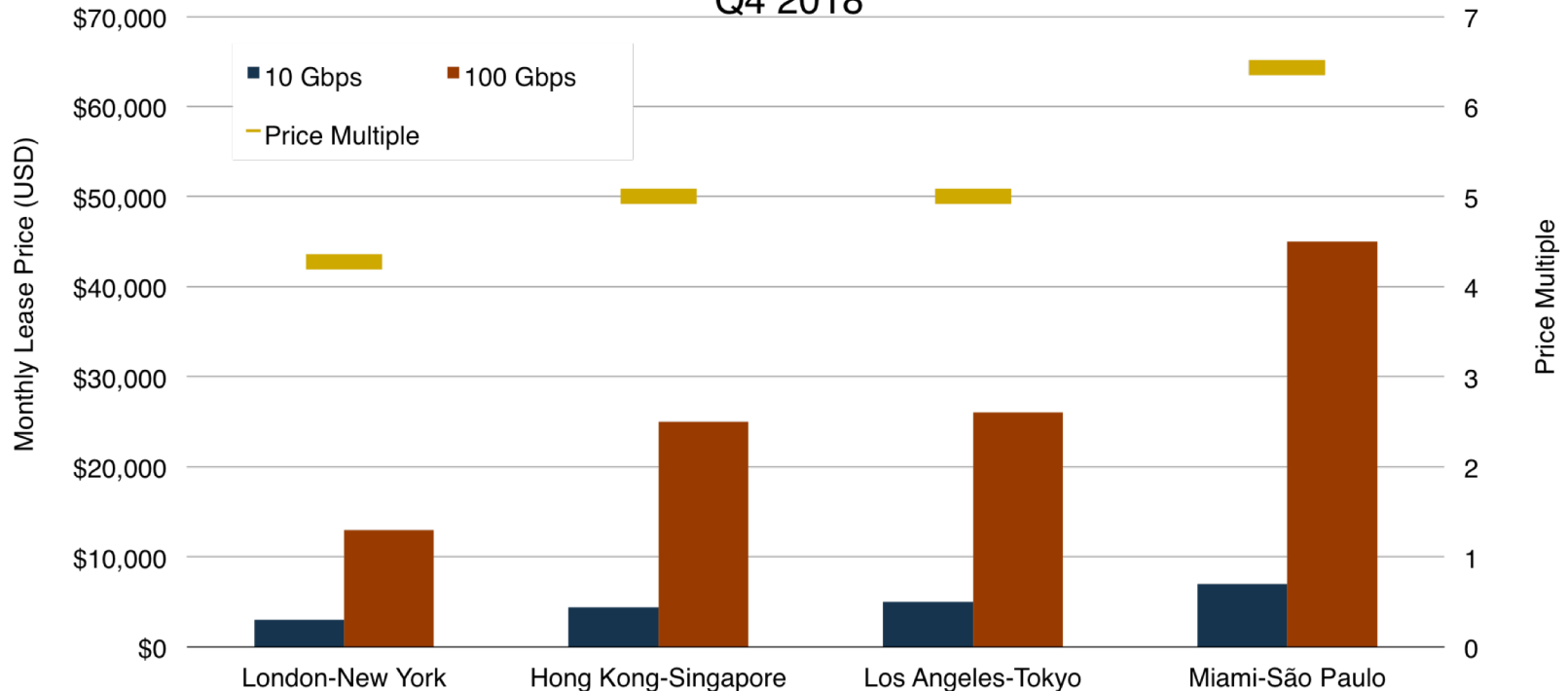
# 100G Wavelength Pricing

## Weighted Median 100 Gbps Wavelength Prices, 2015-2018

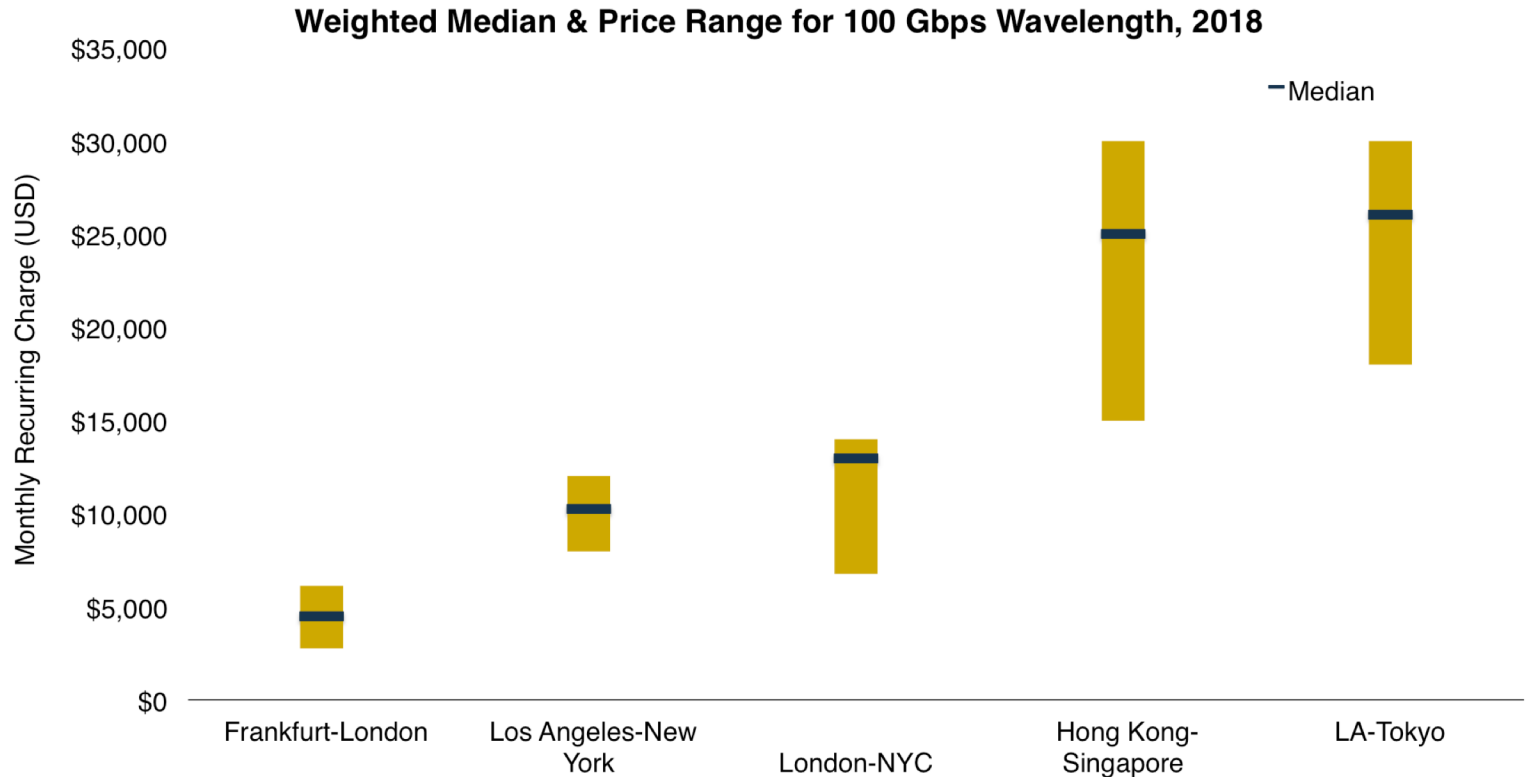


# Capacity multiples falling

10 Gbps & 100 Gbps Wavelength Weighted Median Prices & Multiples, Q4 2018



# 100G price ranges remain wide (for sub-cable routes)





# The Transit Hubs

# Recall our defined key hub cities

## Europe

- **F**rankfurt
- **L**ondon
- **A**msterdam
- **P**aris

## Asia

- Tokyo
- Hong Kong
- Singapore

## North America

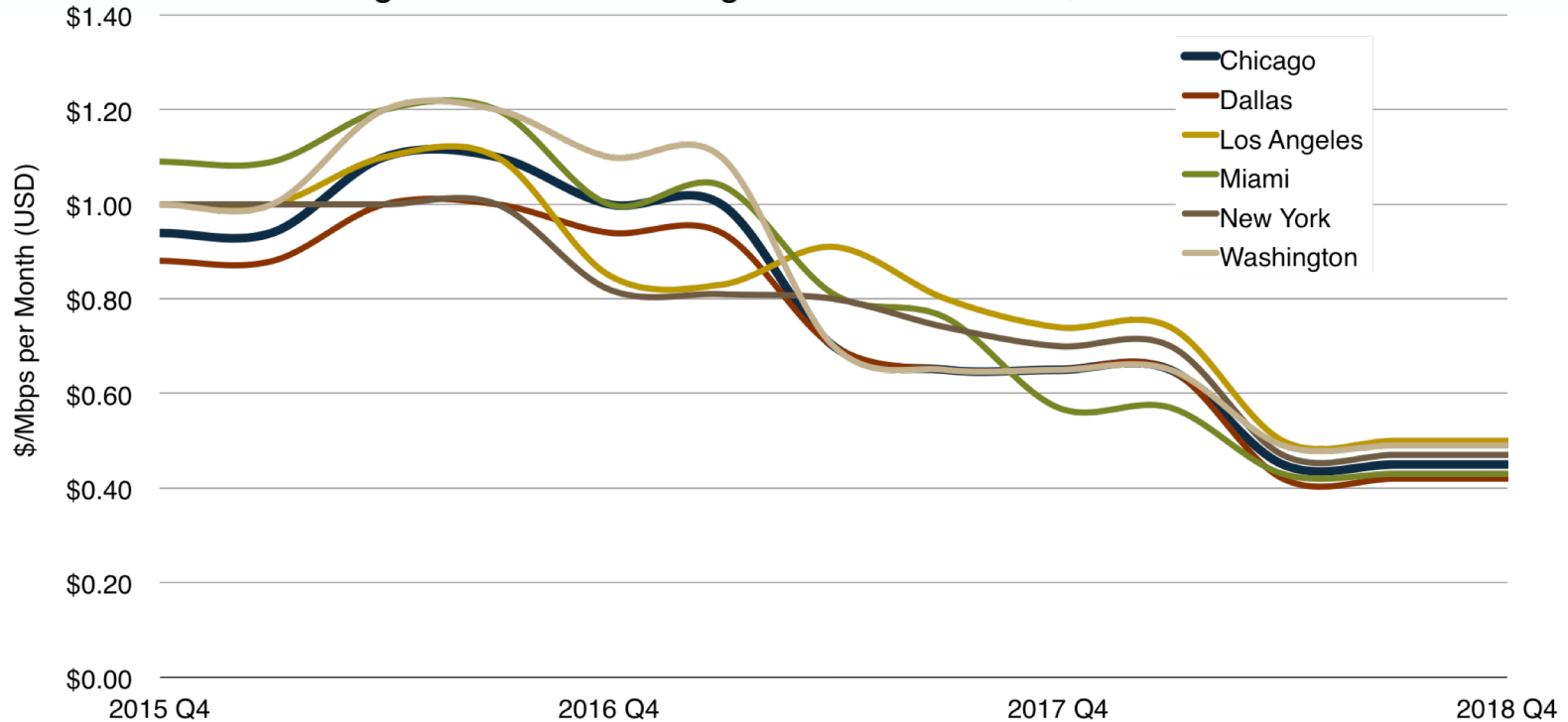
- New York
- Washington (NoVA)
- Chicago
- San Francisco
- Los Angeles
- Dallas
- Miami*

# What do these hubs look like?

- Infrastructure perspective:
  - Highly available network, interconnection facilities, and connected international bandwidth
- Transit pricing perspective:
  - Low, standardized price levels for the given region
  - Moderate levels of price decline
  - Price declines are sustained at a relatively steady pace over time

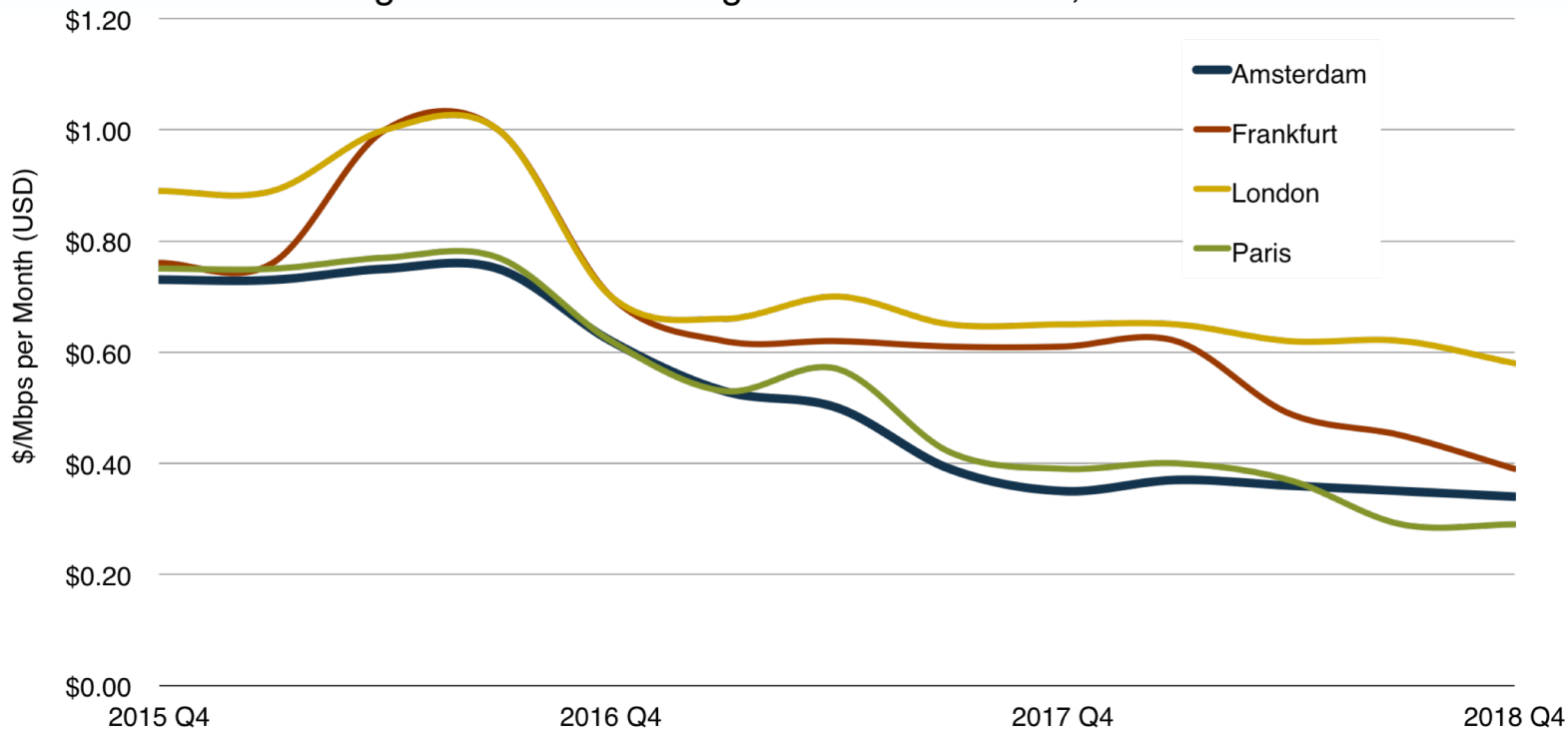
# US hubs

## Weighted Median 10 GigE IP Transit Prices, 2015-2018



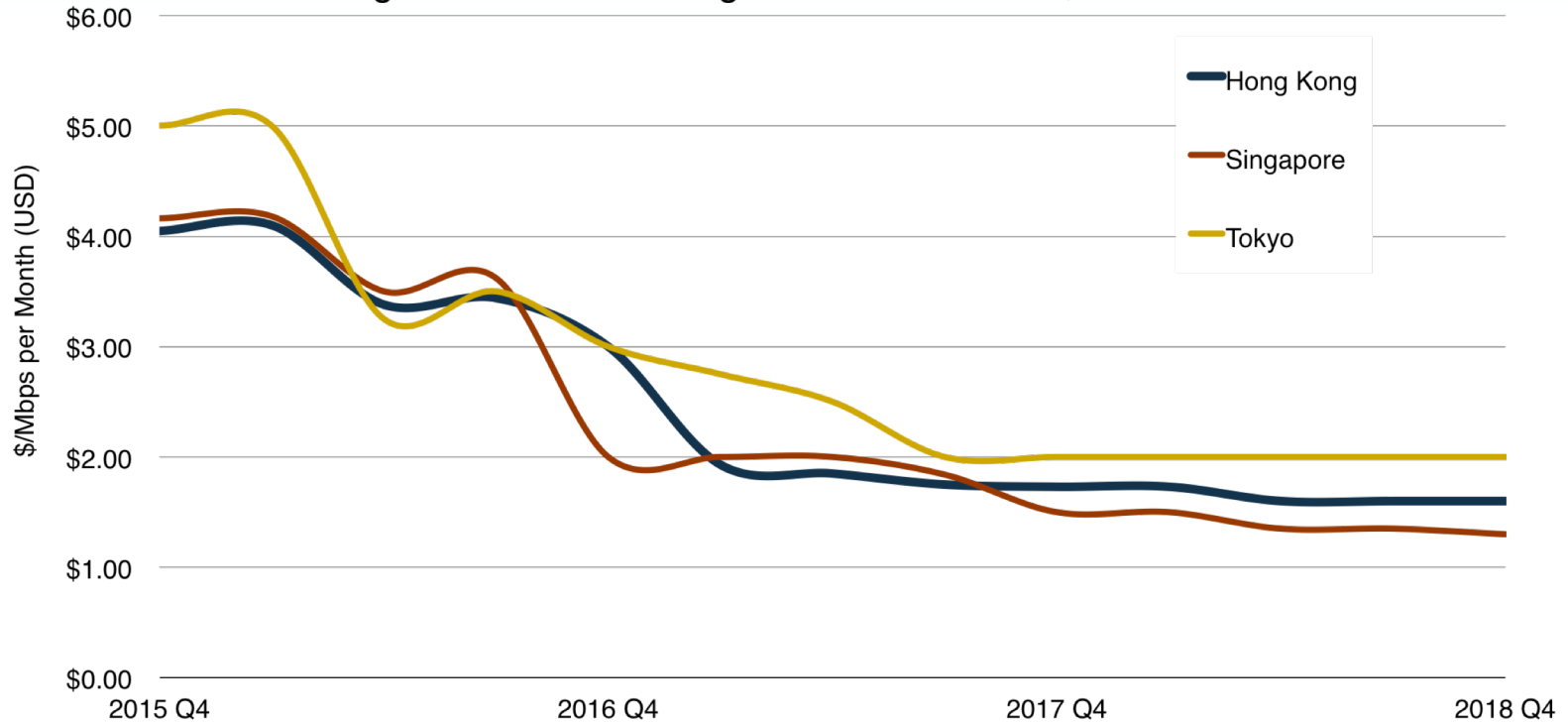
# Europe hubs

## Weighted Median 10 GigE IP Transit Prices, 2015-2018



# Asia hubs

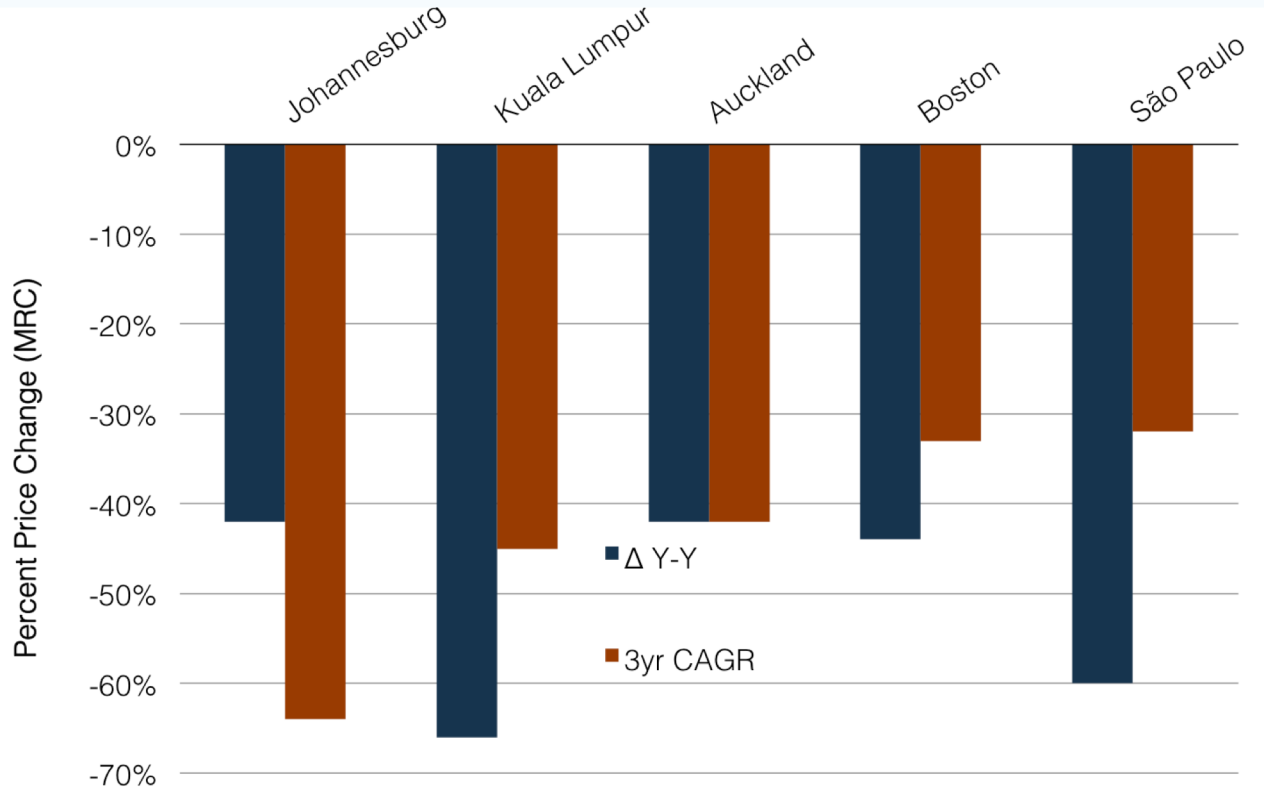
## Weighted Median 10 GigE IP Transit Prices, 2015-2018



# What might emerging hubs look like?

- Infrastructure perspective:
  - Influx of fresh international bandwidth connectivity, major content players placing facilities in the area, favorable interconnection infrastructure, closer access to the “edge”
- Transit pricing perspective:
  - Edge markets with higher current pricing than existing hubs
  - High levels of historical price decline
    - here, sustained declines over 30% (3-year CAGR)
  - Price has continued to decline recently, without “stalling”
    - here, also maintained 30% year-on-year declines in 2018

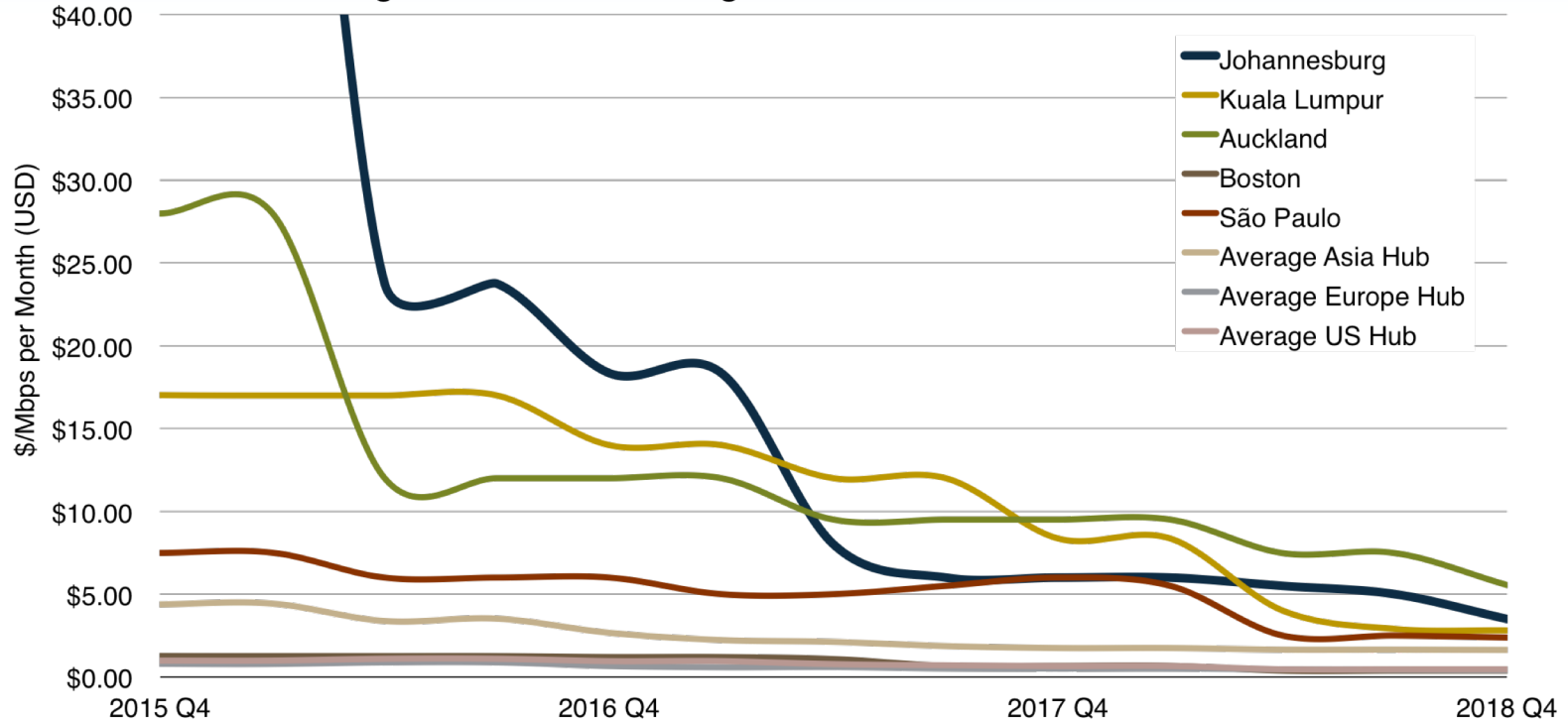
# Potential new hubs emerging?





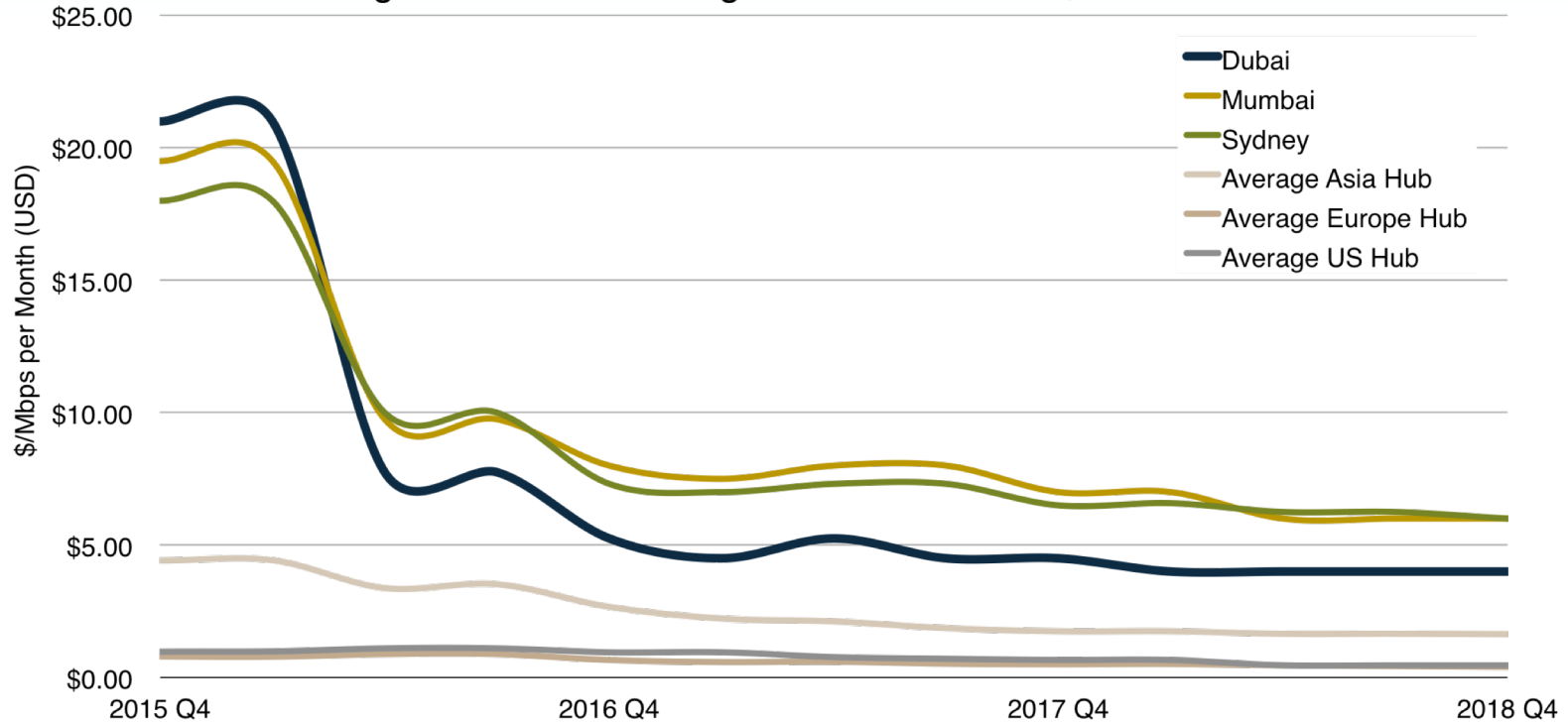
# Potential new hubs emerging?

## Weighted Median 10 GigE IP Transit Prices, 2015-2018



# Once emergent hubs can stall...

Weighted Median 10 GigE IP Transit Prices, 2015-2018



# New cable pricing dynamics

## Effects of new cables

- Many new cables entering service; but do all routes face a similar pricing destiny?
- Variety of factors can shape how the market on a given route responds to a newly introduced system
  - Who is doing the building; carriers or content?
  - How many systems and how much bandwidth is already deployed?
  - How unique is the routing choice?

# Three regional case studies

- We'll take a look at three specific scenarios that have played out in recent history
- In the previous 4 years –
  - Was a “content cable” built?
  - How many existing systems were in deployment?
  - How many new systems were deployed?
  - How much additional potential capacity got deployed?
  - What was the resulting price change

# Trans-Atlantic: Slowing declines

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	2		
Systems already in service	9		
Content cable investment?			
Increase in total potential capacity from new cables	175%		
10G price change (2-yr CAGR)	-21%		

# Trans-Atlantic: Slowing declines

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	2	1	
Systems already in service	9	11	
Content cable investment?			
Increase in total potential capacity from new cables	175%	55%	
10G price change (2-yr CAGR)	-21%	-13%	

# Trans-Atlantic: Slowing declines

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	2	1	2
Systems already in service	9	11	12
Content cable investment?			
Increase in total potential capacity from new cables	175%	55%	80%
10G price change (2-yr CAGR)	-21%	-13%	?



# US-Brazil: Collapsing Rates

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	1		
Systems already in service	4		
Content cable investment?			
Increase in total potential capacity from new cables	100%		
10G price change (2-yr CAGR)	-39%		

# US-Brazil: Collapsing Rates

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	1	3	
Systems already in service	4	5	
Content cable investment?			
Increase in total potential capacity from new cables	100%	200%	
10G price change (2-yr CAGR)	-39%	-31%	

# US-Brazil: Collapsing Rates

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	1	3	0
Systems already in service	4	5	8
Content cable investment?			
Increase in total potential capacity from new cables	100%	200%	0%
10G price change (2-yr CAGR)	-39%	-31%	?

# Trans-Pacific: A middle ground

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	1		
Systems already in service	6		
Content cable investment?			
Increase in total potential capacity from new cables	95%		
10G price change (2-yr CAGR)	-30%		

# Trans-Pacific: A middle ground

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	1	2	
Systems already in service	6	7	
Content cable investment?			
Increase in total potential capacity from new cables	95%	55%	
10G price change (2-yr CAGR)	-30%	-18%	

# Trans-Pacific: A middle ground

	Q4 14 - Q4 16	Q4 16 - Q4 18	Q4 18 - Q4 20
Cables built	1	2	3
Systems already in service	6	7	9
Content cable investment?			
Increase in total potential capacity from new cables	95%	55%	100%
10G price change (2-yr CAGR)	-30%	-18%	?

# Summary

- Even in a higher-capacity world, 10G pricing continues to decline
  - The rate, however, is slowing
- The multiple to 100G is converging into a tighter range, across various global routes
- The core IP transit hubs exhibit sustained, and steady price erosion
  - There is evidence that some new hubs may be on the horizon, as content moves the edge and capacity prices to these regions fall
- New cables, especially those sponsored by content players, can accelerate price declines
  - Incremental cables on heavily trafficked routes and cables with a novel routing have less of an impact
  - Cables with similar routing on less demanded routes can have an even greater effect

Michael Bisaha  
Manager, Data Science  
TeleGeography  
mbisaha@telegeography.com