SKYFIBER™

Mark Doucet, Founder & Chief Technology Officer

What is Free Space Optics?

It is a wireless technology that uses the license Free Atmosphere (Space) for transmission of its Optical/Light based signal

Why should you care about Free Space Optics?

COST	• As low as half the cost of microwave and a tenth the cost of fiber. • NO RF SPECTRUM REQUIRED
CAPACITY	• Up to 1 Gbps Broadband speeds and just getting started. • Microwave is at the outer edges of it's capacity
SECURITY	• Totally secure transmission, impervious to interception • No interference from other wireless frequencies
SPEED	• Installation can be completed in as little a 1 day • No FCC licenses, no permits, no right-of way needed

Free Space Optics - Past

Past - So how far in the past do we go?

- Light is as old as creation itself
- Light consists of visible and invisible electromagnetic radiation (UV, Visible, IR)
- Light is Communication

"It allows us to see and understand the world we live in"

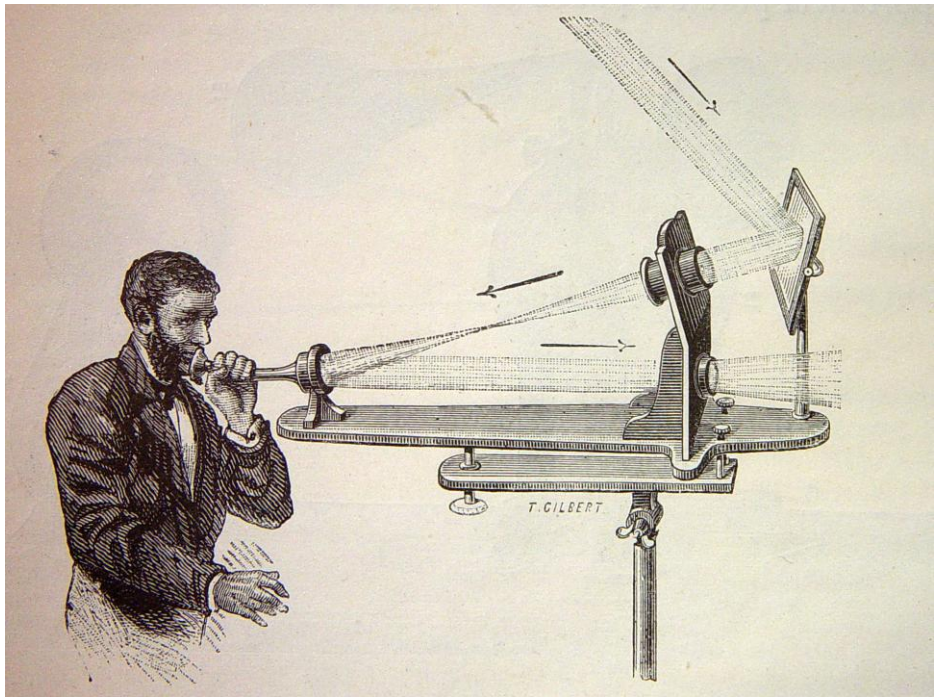
Light is Communication

Past - Lighthouse of Alexandria ~ 280 B.C.

- **7th Wonder of the Ancient WorldConstruction began shortly after the death of Alexander the GreatLarge mirror reflected sunlight or firelight to guide approaching shipsSome accounts indicate the light could be seen up to 47km away.**

The Idea of using light to communicate is not new.

Past - Photophone June 3rd 1880.



- Alexander Graham Bell
- Used Reflected Sunlight to transmit
- 1st wireless telephone message
- From rooftop through the window
- 213 meters
- His greatest invention

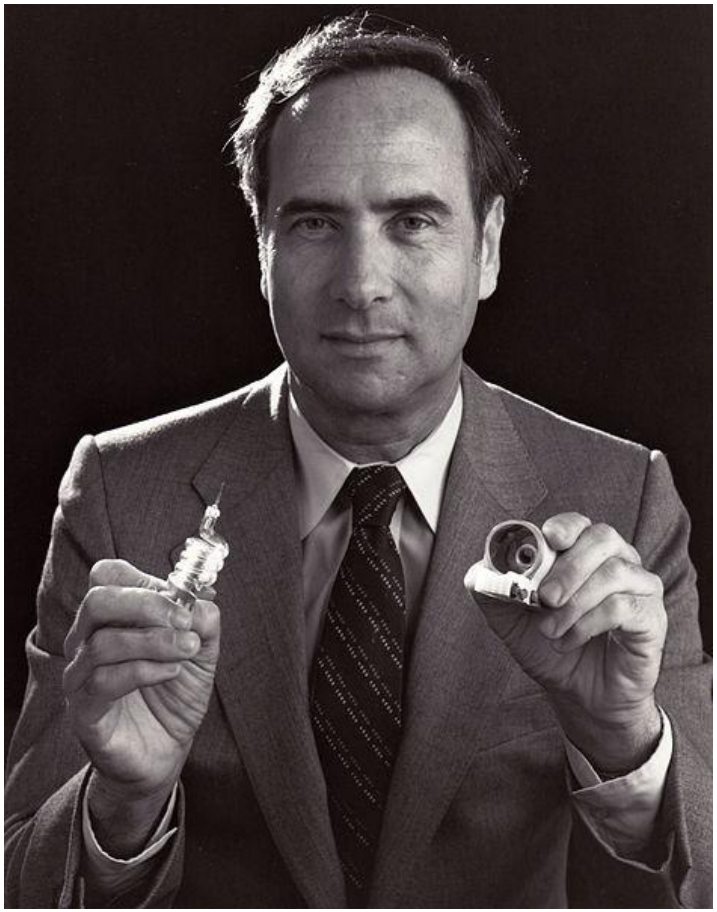
1st Wireless Telephone message

Past - Lichtsprechgerät 80 ~ 1940.

- Carl Zeiss Jena
- Light Radio
- 1st Known Military application
- Used 5W Visible Light bulb
- 2km
- Used to communicate covertly during WW2

1st Wireless Military Use

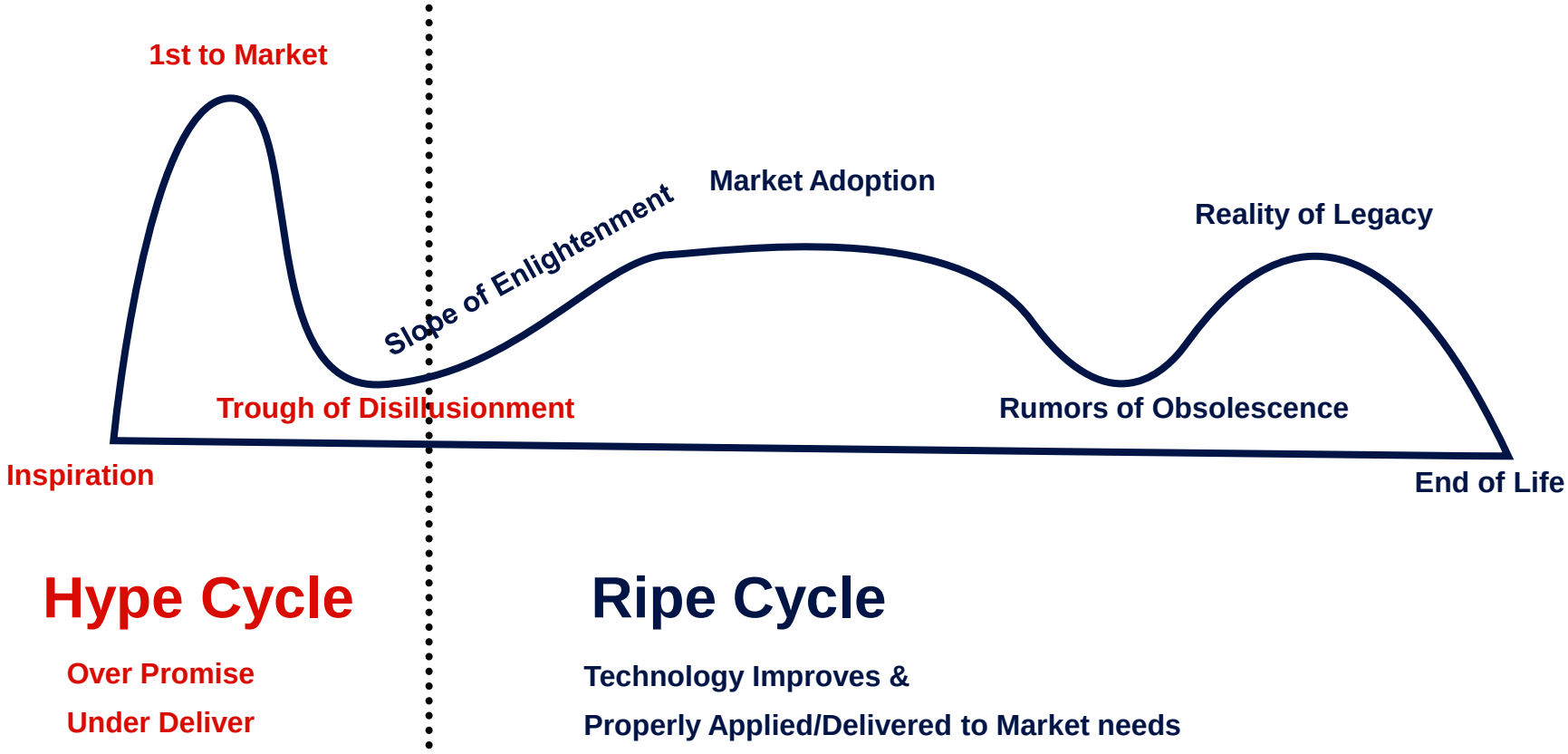
Past - Birth of the Laser 1960.



- **Theodore H. Maiman**
- **Precursor to Modern Fiber Optics & Wireless Laser Communications (FSO)**

Game Changer for Light Communciations

Commercial Adoption Curve



Hype Cycle

Over Promise

Under Deliver

Ripe Cycle

Technology Improves &

Properly Applied/Delivered to Market needs

1st to Market - Over Promises

Past - 1st to Market Players 1980 - 1990s.

- $45K - $150K U.S.
- ~ 100lbs
- 155Mbps to 622Mbps

Large & Expensive

Past - 1st to Market Players 1980 - 1990s.

- > **45 lbs**
- > **$45K >**

Did I already say, “Large & Expensive”

Past - 1st to Market Players Summary

- **$45K >**
- **Very High Speed for the time**
- **Costly and Time Consuming Installation (~5K/side)**
- **Trying to compete with Microwave/RF, claimed distances up to *15Km* but only delivered 500m to 2000m in most geographies due to weather**
- **Sensitive Positioning Alignments = High Maintenance**
- **Poor Rain & Fog Performance**

Price and Weather Performance Limited Market Adoption

Free Space Optics - Today

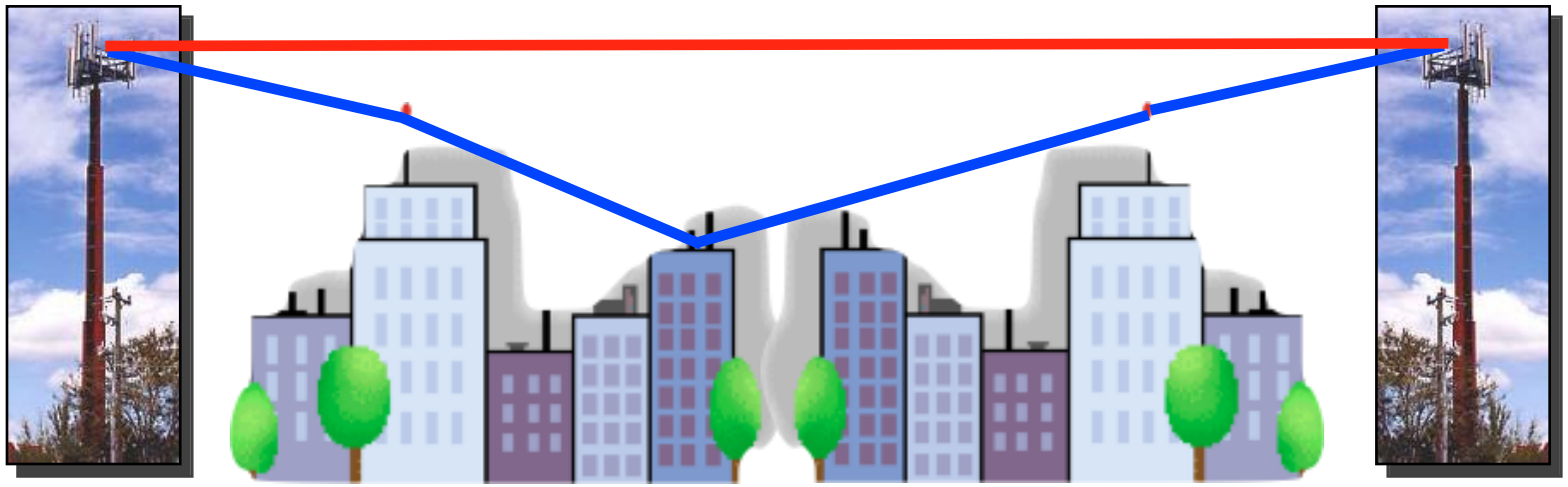
How are the current FSO Vendors addressing the 1st to Market problems?

	1st to Market	Present
Weight	45-100lbs	**11.4lbs**
Speed	155-622Mbps	**100-1Gbps**
Install/Cost	$5K/side	**$750/side**
Cost/Link	$45K >	**$12K >**
Active Steering	No	**Yes**
Rain	Poor	**Better than MM Wave**
Fog	Poor	**Improved but still limited**

Smaller, Lighter, Faster, More Reliable, More Economical (Much Better Products than 1st Gen. FSO)

How are the current FSO Vendors addressing the 1st to Market problems?

1st to Market Vendors Deployment Concept
(Try to compete with Long Distance RF)



Current Market Players Concept:
Short Links (1Km - 1.6km) for Dense Metro Applications
(Mesh Campus/City Wide Networks)

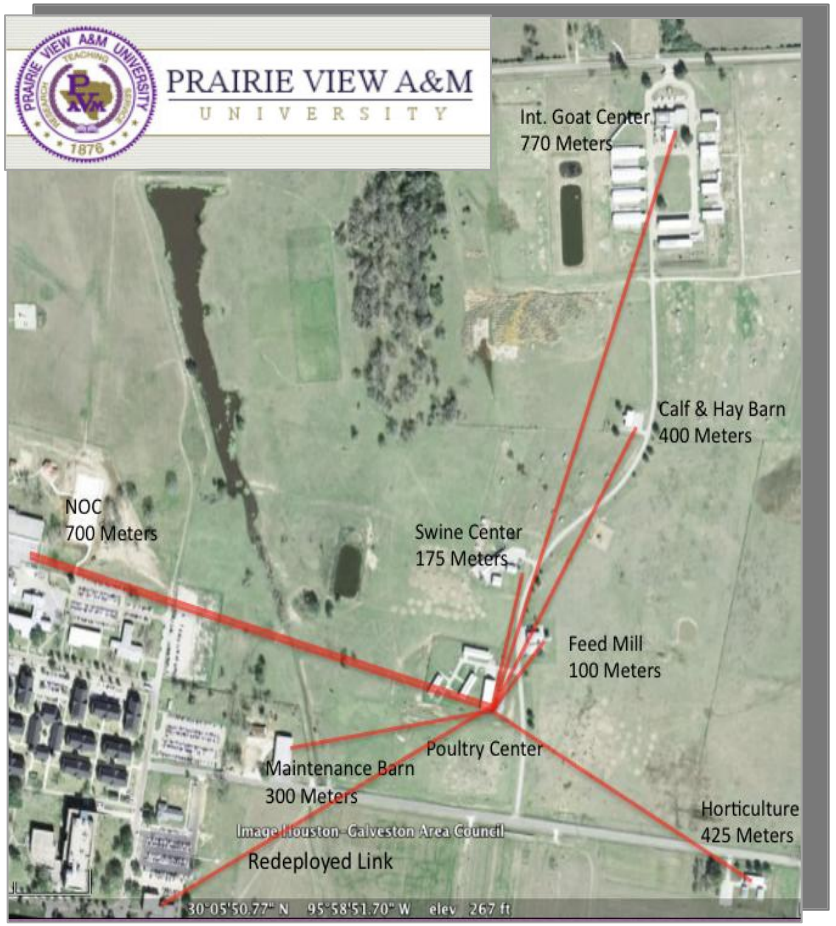
Apply the technology where it is best suited

University: *Connecting a Forward-Thinking Campus*

PROBLEM:
Customer needed a high bandwidth, cost effective solution to provide connectivity to multiple buildings on campus.

SOLUTION:
SKYFIBER's delivered 100 Mbps & 1 Gigabit connectivity to seven buildings in a point-to-multi-point deployment.

SUCCESS:
SKYFIBER was a fraction of the cost of the competing broadband options, and installation took just a matter of days.



"We were extremely pleased to have our **problem solved** so **rapidly and economically.** Trenching to lay fiber or copper lines would have been a completely unnecessary waste of resources."

CUDI Primavera 2012- Ensenada Installation

- Extending the CICESE Network
- Video, Voice, & Internet
- 1.5 Days Install
- 600m
- 1 Gbps
- No Right of Ways
- Shooting over HW 1
- License Free

Apply the technology where it is best suited

IUSACELL Triple Play, Mobile Backhaul & Corporate Bandwidth Delivery in Sante Fe Region of Mexico City

- **25 Total Sites**
- **24 of 25 Sites Survived Multiple Earthquakes (7.6) and multiple (5.0) without maintenance**
- **The one that needed maintenance was due to damaged building foundation. (Just required running automated scan to bring it back up)**

Performance has exceeded expectations

Free Space Optics - Future

Future of FSO

- Faster Tracking Speeds (1˚-3˚ towers)
- Faster Data Speeds 2.5G - 10G
- Fog Performance Improvements
- Longer Distances
- Integrated RF
- Smaller Form Factors (3.5lbs.)
- Lower Prices

It Just Gets Better from Here

Questions & Answers