

New York State Photonics Board Public Meeting



Built to Lead



**Photonics
Board**



A BRIEF OVERVIEW OF
Photonics Site Selection...

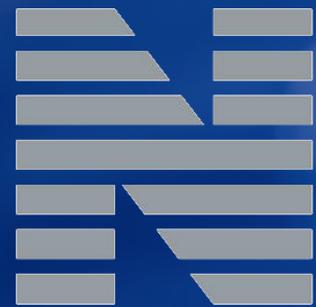
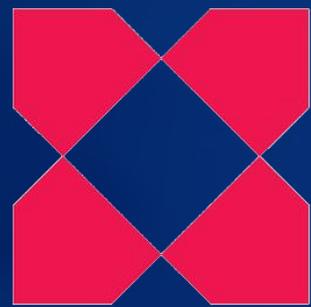


Rochester was selected to be the national headquarters for photonics research because the **Finger Lakes Region** is home to world-class research institutions, robust manufacturing capabilities, and a top-tier workforce.

One of our first steps to bringing photonics to the Finger Lakes Region is to site the **TAP facility**, which will be used to test, assemble and package photonics semiconductors.



**The TAP facility is comprised of
22,000 square feet of specialized clean rooms,
state-of-the-art laboratories, plus office space.**



**Newmark Grubb
Knight Frank**

In August, ESD selected **NGKF through a competitive RFP to act as an independent site-selector for the TAP facility.**

Since September, we have conducted...



5

**DAYS IN
MARKET**

- Kick-off meetings
- Windshield tours
- Community orientation
- Real estate assessments
- Stakeholder interviews



10

SITE TOURS

- Public and privately held ownership options
- Locations in several cities/towns throughout the Greater Rochester metro area
- Accompanied by consulting project management team



>30

**STAKEHOLDER
INTERVIEWS**

- AIM leadership
- TAP technical review board
- AIM industry members
- Academic stakeholders
- Political representatives
- Other community reps

Criteria

Qualitative Assessment: Site selections were chosen based on a comprehensive system of analysis that consisted of five major categories, covering a total of 31 individual sub-criteria.

Cost Assessment:



Recurring Operating Costs, such as real estate occupancy, utilities

+

1x

One-Time Retrofit Costs, including office, lab, and clean room renovations, and building level upgrades

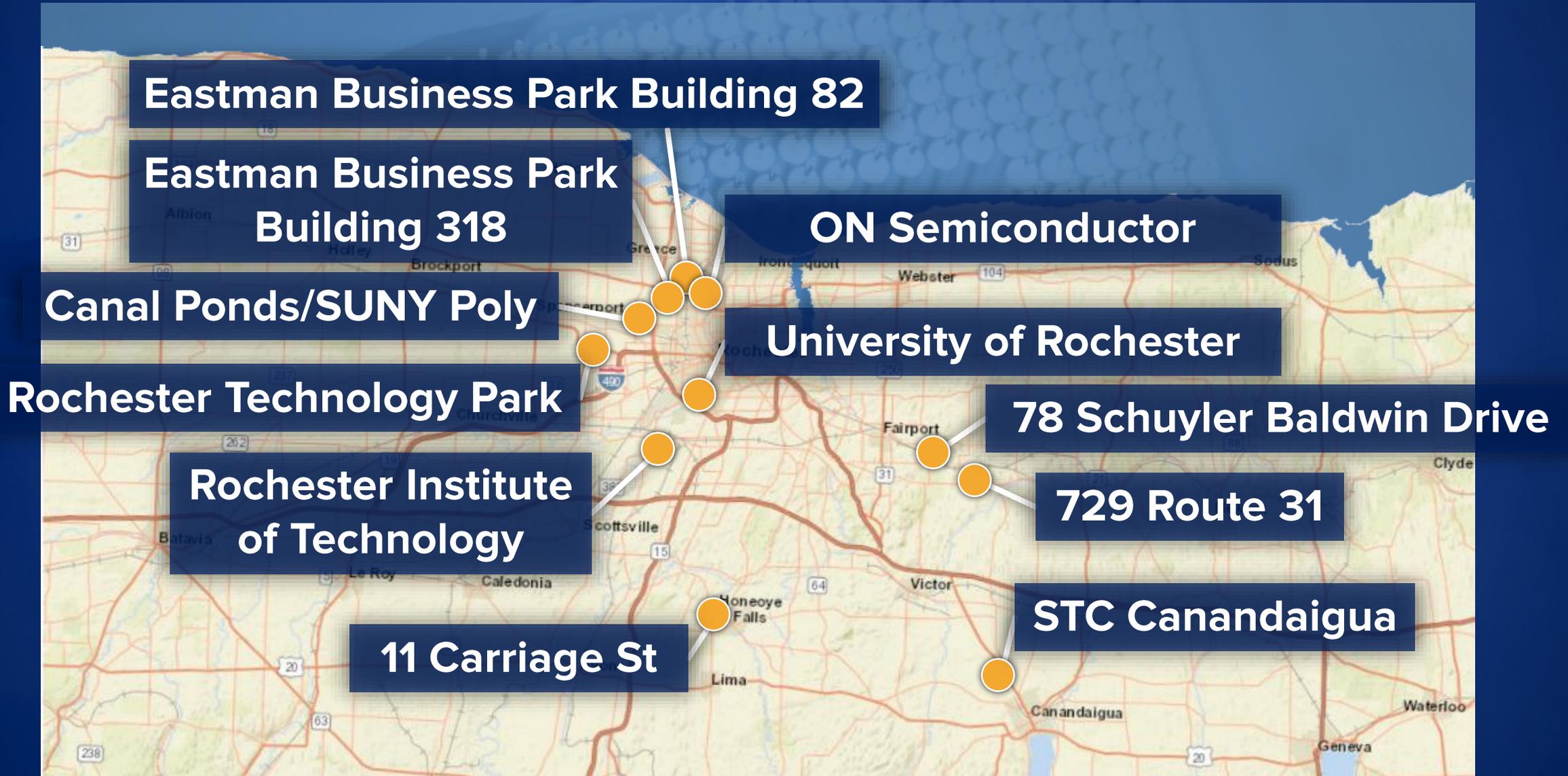
Site Selection Process

The vast majority of the submitted sites were feasible.

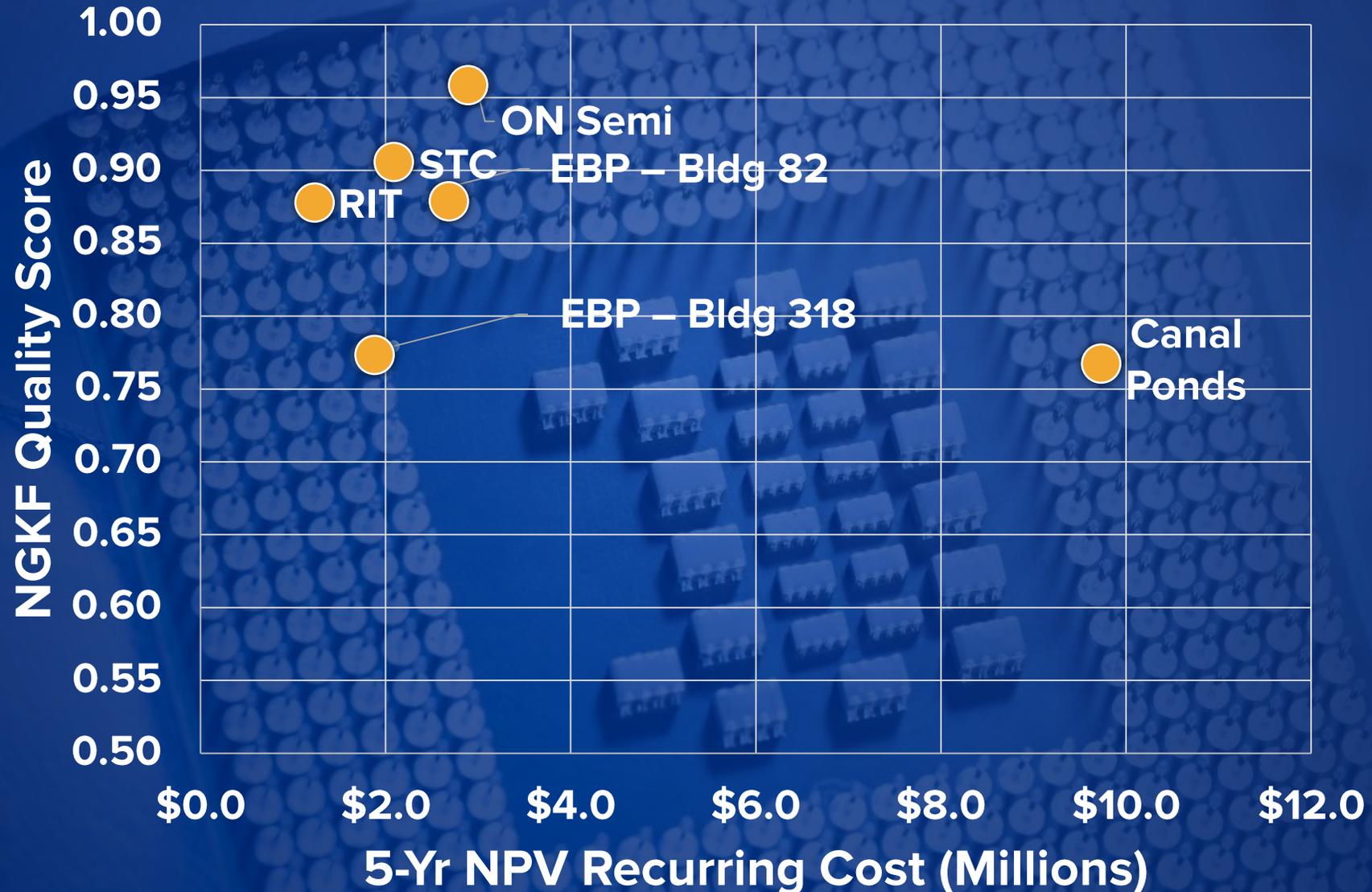


★ All qualified sites received an RFQ

11 RFQ Respondents



Highest Quality, Lowest Cost Options



Finalists



- Less expensive recurring costs
- Likely to have the lowest 1x costs
- Among highest quality scores
- Ready to accept equipment immediately
- On-site engineering / property management team
- Significant existing infrastructure
- Regional accessibility
- Complete and detailed RFQ submitted
- Landlord has long-term stability



ON Semiconductor
at Eastman Business Park

- Highest quality score of all candidate sites
- Significant existing infrastructure
- Ability to leverage existing infrastructure to potentially aid in project timing
- On-site engineering/property management team
- Regional accessibility
- Complete and detailed RFQ submitted

Our TAP Technical Team has thoroughly analyzed the finalists.

- **Reviewed the two finalist sites**
- **Analyzed key points of each site's proposal**
- **Conducted additional site inspections**
- **Proposed capital work and associated timeline**
- **Narrowed scope of operational expenses**
- **Established lease terms and conditions**

Today we are announcing our recommendation
to site the nation's first TAP facility at:



ON Semiconductor
at
Eastman Business Park



EASTMAN
Business Park

New York State Photonics Board Public Meeting



Built to Lead



**Photonics
Board**

New York State Photonics Board Public Meeting



Built to Lead



**Photonics
Board**



New York State Photonics Board of Officers
Public Meeting

Eastman Business Park
December 12, 2016

Charge for the NYS Photonics Board of Officers

The New York State Photonics Board of Officers will oversee and implement the investment of State funds committed to support the efforts of the American Institute for Manufacturing Integrated Photonics (AIM Photonics).

State funds will be administered in accordance with the terms identified in AIM Photonics application, which was submitted by a consortium of organizations and selected by the Department of Defense to be the Integrated Photonics Institute for Manufacturing Innovation (IP-IMI), and should be focused on the economic development of the photonics industry, particularly in Rochester as identified by Governor Cuomo.



Updates since last meeting on 6/22/2016:

ESD & PACB approval of \$78M recommended funding

RFP for equipment

TAP site selection process

New AIM Photonics Tier 1 members: Infinera & Samtech

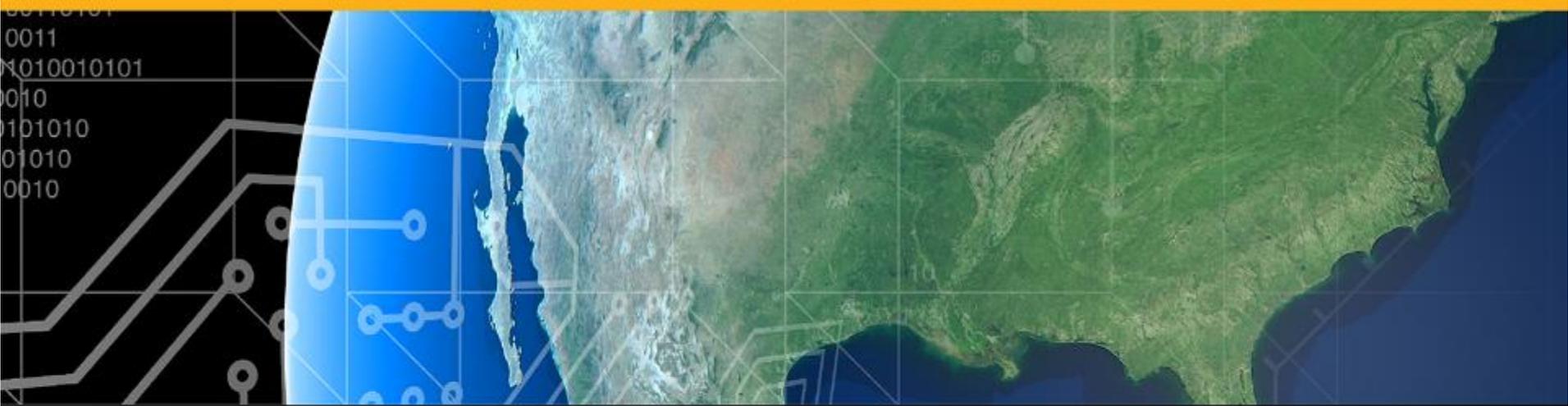
NYSTAR job postings to support AIM Photonics

MCC FWD Center at EBP

New Board Officers appointed

New DOD Program Director

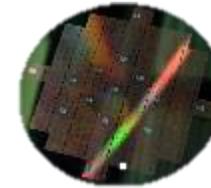
Integrated Photonics Institute *for Manufacturing Innovation*



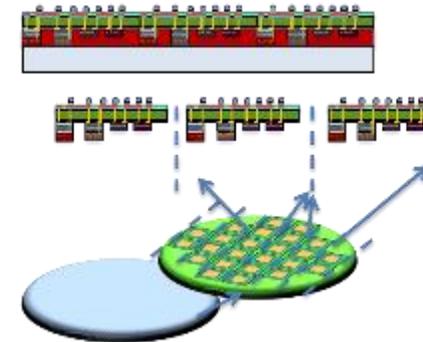
2017 – 2018 NYS Budget Request

- ❑ Two Multi Project Wafer runs – SME support
- ❑ Process Design Kit released – Aiding design-ins
- ❑ Design methodology progressing - productivity
- ❑ First 14 Projects active; 2017 selections made
- ❑ AIM Academy for Roadmapping, Education, and Workforce Development
- ❑ 60 members signed, 5 tier 1 expected to join by YE
- ❑ *Test Assembly and Packaging (TAP) Hub in Rochester New York*

1. *Wafer-level* active photonics chips
 - Wafer processing of optical elements
 - Laser bonding

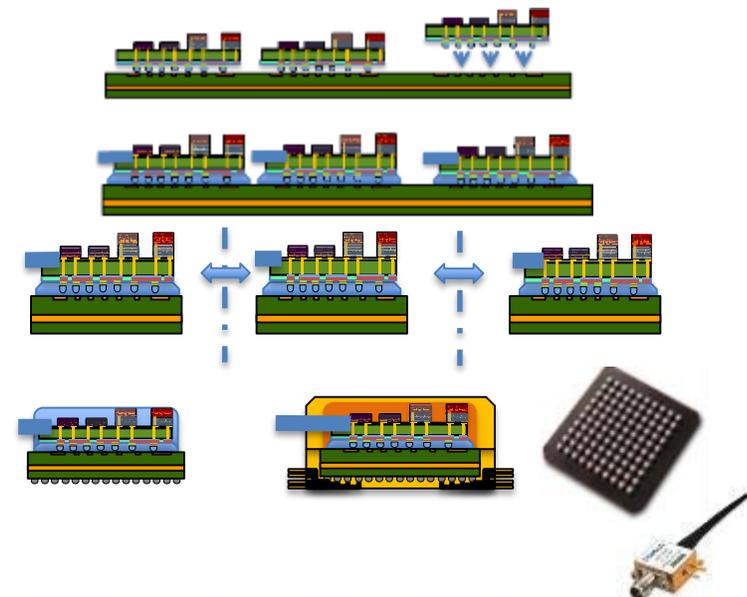


2. *Wafer-scale* photonics packaging
 - First-level interposer metallization
 - De-bond and dicing of wafers



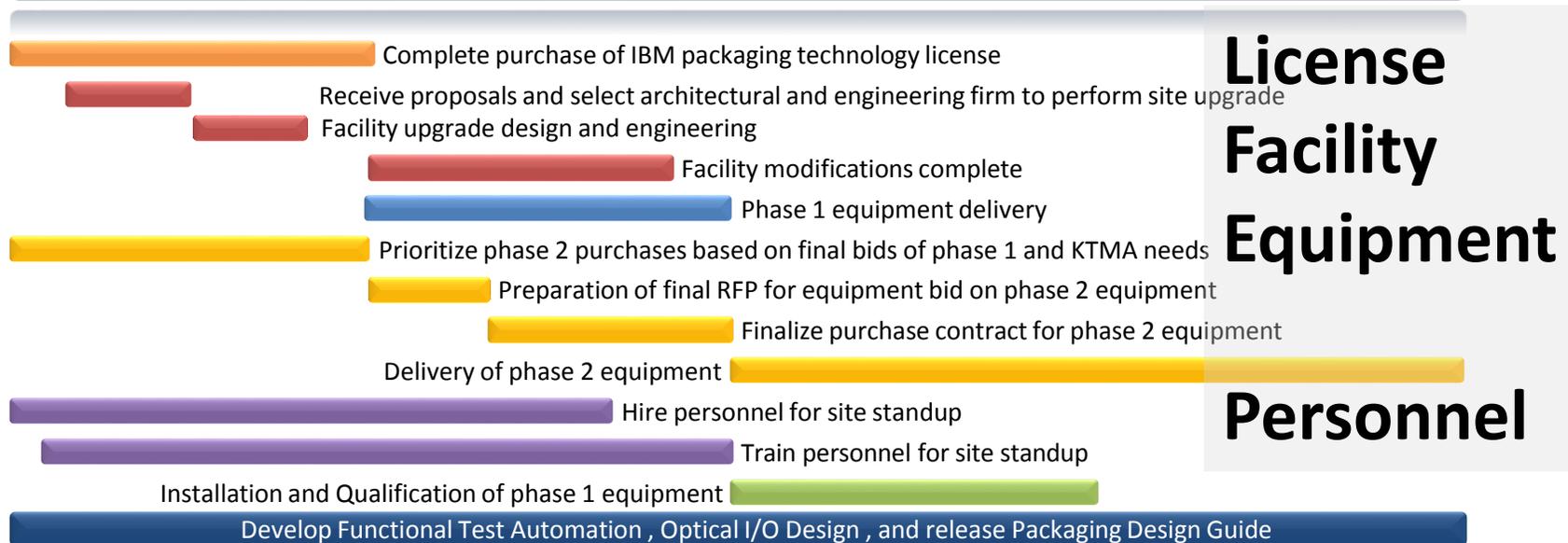
70-80% of the cost of a Si-photonics system is in the package

3. *Chip-scale* test, assembly and packaging
 - Laminate and fiber attach
 - Manufacturing technology development and hardware support



Funding Request Item	[\$M]
Capital	
Tools/Equipment and Installation	\$ 58.0
High Speed Optical Packaging Technology License	\$ 10.0
TOTAL CAPITAL	\$ 68.0
Operations and Maintenance	
Education and Workforce Development (UR \$0.5M, RIT \$0.5M)	\$ 1.0
R&D Project State Match (UR 1.0M, RIT \$1.0M)	\$ 2.0
AIM Operating Wafer, Test Package, Assembly Budget	\$ 7.0
TOTAL O&M	\$ 10.0
Remaining Spent Items	
Cleanroom Configuration Estimate	TBD
Building Utilities Upgrade Estimate	TBD
Workspace Upgrades	TBD
5 Year Site Payment	\$ 3.5
Wafer-level Packaging Equipment	TBD
Building-driven Contingencies	\$ 1.5
Ceiling Height	
Vibration Reduction	
Tool Delivery/Installation	
General Project Contingency	TBD
TOTAL REMAINING EXPENSES	\$ 28.0
Overall 2016-2017 Expenses	\$ 106.0

Rochester Hub Standup 2017 Timeline



- The 2016/2017 budget allowed to establish the generic base facility and equipment set for the TAP facility

- *Out of scope for 2016:*
 - *Full equipment set for wafer scale packaging (2016 is partial)*
 - *Floor control system (line logistics and analysis)*
 - *Member-driven capability adds*
 - *Wafer-level capacity and cycle time*

- The 2017 budget request adds the above

- The proposed NYS budget, in support of AIM Photonics programs located in NYS, is **\$81 million**
- The proposed budget covers the period April 1, 2017 through March 31, 2018
- The 2017-2018 proposed budget is the second tranche of NYS expenditures. Including this proposed budget, the NYS expenditures, through March 31, 2018 will be:

\$106 Million April 1, 2016 – March 31, 2017

\$ 81 Million April 1, 2017 – March 31, 2018

\$187 Million

- The summary of the 2017 – 2018 expenditures is:
 - \$71 Million for Capital Tools and Equipment
 - \$10 Million for Operating and Maintenance
 - \$81 Million Total**

(The itemized Budget is shown on the following slide)

Funding Request Item	Purpose	[\$M]
Capital		
Test, Assembly & Packaging Tools/Equipment and Installation 2016 Carry-Over	Continued Installation of Base Capability	\$ 10
Test, Assembly & Packaging Tools/Equipment and Installation	Additions Capability	\$ 25
Wafer Fab & MPWA Tools/Equipment	Improvement to Capability, Additions to Capacity, Reduction of Process Cycletime	\$ 30
Bio Safety Lab Tools & Equip	Additions to Capability	\$ 1
Test, Assembly & Packaging Manufacturing Execution System (MES)	Addition to Capability	\$ 5
TOTAL CAPITAL		\$ 71
Operations and Maintenance		
Education and Workforce Development (UR \$0.5M, RIT \$0.5M)		\$ 1
R&D Project State Match (UR 1.0M, RIT \$1.0M)		\$ 2
AIM Operating Wafer, Test Package, Assembly Budget		\$ 7
TOTAL O&M		\$ 10

Proposed 2017 - 2018 Budget \$ 81