Functional Performance Specification (FPS) and Value Engineering Study (VE)

CBSA On-Site Commercial Processing Centre

CSVA 2009 Conference
Ottawa, Ontario

Nov 23 - 24, 2009

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Project Background

- Part of the “Let’s Get Windsor-Essex Moving strategy”
- McCormick Rankin retained to prepare a Master Plan Study to improve operations at the Canada Plaza of the Windsor-Detroit Tunnel
- One component is the proposed On-Site Commercial Processing Centre
- Currently, tagged commercial vehicles have 8 minutes to travel from the Plaza to the existing commercial processing centre along congested City streets
- Proposed On-Site Commercial Processing Centre will enhance safety and operations at the Plaza

Functional Performance Specification Study

- Powerful tool to identify, clarify and set parameters for technical requirements of project
- Without strictly defining the design/solution
- Systematic, disciplined approach to identify the functions needed in a successful project
- Three-day FPS held in Windsor, ON from Sept. 11 to 13, 2007

Functional Performance Specification Study

- **Objectives:**
  - Identify and characterize necessary functions to be provided by the conceptual design of the CBSA OSCPC; and
  - Begin building consensus among the many stakeholders of this important project.

FPS Study Team

- MTO
- City of Windsor
- CBSA
- CRA
- DCTC
- Consultant Team

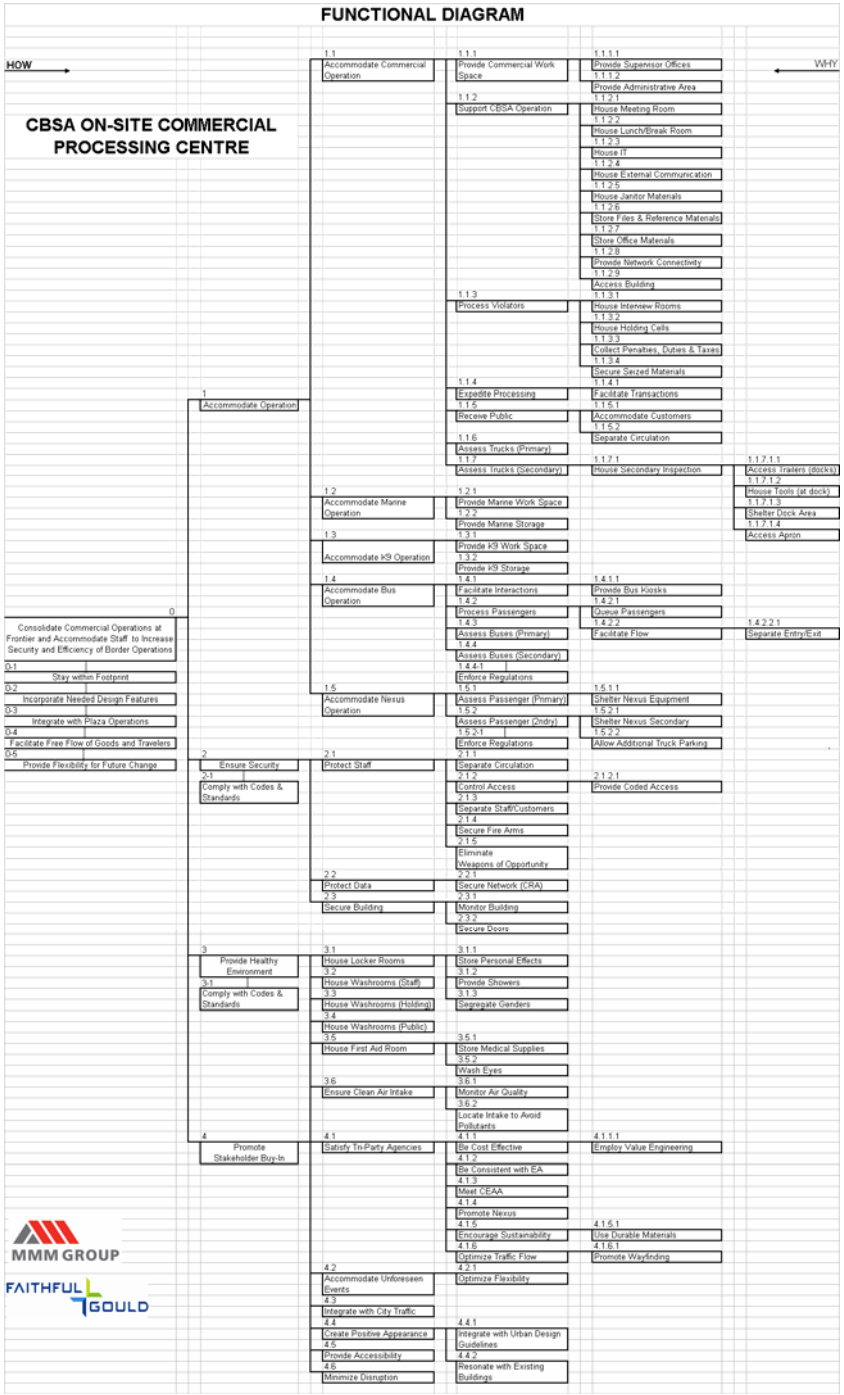
Functional Performance Specification Study

- Main Goal for the CBSA OSCPC

  "Consolidate Commercial Operations at Frontier and Accommodate Staff to Increase Security and Efficiency of Border Operations"

- Four Main Branches
  - Accommodate Operations
  - Ensure Security
  - Provide Healthy Environment
  - Promote Stakeholder Buy-In

- Vehicles to be Accommodated in new CBSA OSCPC:
  - Trucks
  - Busses
  - Nexus Vehicles


FUNCTIONAL DIAGRAM
HOW
WHY
CBSA ON-SITE COMMERCIAL PROCESSING CENTRE
0 Consolidate Commercial Operations at Frontier and Accommodate Staff to Increase Security and Efficiency of Border Operations
0-1 Stay within Footprint
0-2 Incorporate Needed Design Features
0-3 Integrate with Plaza Operations
0-4 Facilitate Free Flow of Goods and Travelers
0-5 Provide Flexibility for Future Change
1 Accommodate Operation
1.1 Accommodate Commercial Operation
1.1.1 Provide Commercial Work Space
1.1.1.1 Provide Supervisor Offices
1.1.2 Support CBSA Operation
1.1.2.1 House Meeting Room
1.1.2.2 House Lunch/Break Room
1.1.2.3 House IT
1.1.2.4 House External Communication
1.1.2.5 House Janitor Materials
1.1.2.6 Store Files & Reference Materials
1.1.2.7 Store Office Materials
1.1.2.8 Provide Network Connectivity
1.1.2.9 Access Building
1.1.3 Process Violators
1.1.3.1 House Interview Rooms
1.1.3.2 House Holding Cells
1.1.3.3 Collect Penalties, Duties & Taxes
1.1.3.4 Secure Seized Materials
1.1.4 Expedite Processing
1.1.4.1 Facilitate Transactions
1.1.5 Receive Public
1.1.5.1 Accommodate Customers
1.1.5.2 Separate Circulation
1.1.6 Assess Trucks (Primary)
1.1.7 Assess Trucks (Secondary)
1.1.7.1 House Secondary Inspection
1.1.7.1.1 Access Trailers (docks)
1.1.7.1.2 House Tools (at dock)
1.1.7.1.3 Shelter Dock Area
1.1.7.1.4 Access Apron
1.2 Accommodate Marine Operation
1.2.1 Provide Marine Work Space
1.2.2 Provide Marine Storage
1.3 Accommodate k9 Operation
1.3.1 Provide k9 Work Space
1.3.2 Provide k9 Storage
1.4 Accommodate Bus Operation
1.4.1 Facilitate Interactions
1.4.1.1 Provide Bus Kiosks
1.4.2 Process Passengers
1.4.2.1 Queue Passengers
1.4.3 Assess Buses (Primary)
1.4.2.2 Facilitate Flow
1.4.2.2.1 Separate Entry/Exit
1.4.4 Assess Buses (Secondary)
1.4.4.1 Enforce Regulations
1.5 Accommodate Nexus Operation
1.5.1 Assess Passenger (Primary)
1.5.1.1 Shelter Nexus Equipment
1.5.2 Assess Passenger (2ndry)
1.5.2.1 Shelter Nexus Secondary
1.5.2.1 Enforce Regulations
1.5.2.2 Allow Additional Truck Parking
2 Ensure Security
2-1 Comply with Codes & Standards
2.1 Protect Staff
2.1.1 Separate Circulation
2.1.2 Control Access
2.1.2.1 Provide Coded Access
2.1.3 Separate Staff/Customers
2.1.4 Secure Fire Arms
2.1.5 Eliminate Weapons of Opportunity
2.2 Protect Data
2.2.1 Secure Network (CRA)
2.3 Secure Building
2.3.1 Monitor Building
2.3.2 Secure Doors
3 Provide Healthy Environment
3-1 Comply with Codes & Standards
3.1 House Locker Rooms
3.1.1 Store Personal Effects
3.2 House Washrooms (Staff)
3.1.2 Provide Showers
3.3 House Washrooms (Holding)
3.1.3 Segregate Genders
3.4 House Washrooms (Public)
3.5 House First Aid Room
3.5.1 Store Medical Supplies
3.5.2 Wash Eyes
3.6 Ensure Clean Air Intake
3.6.1 Monitor Air Quality
3.6.2 Locate Intake to Avoid Pollutants
4 Promote Stakeholder Buy-In
4.1 Satisfy Tri-Party Agencies
4.1.1 Be Cost Effective
4.1.1.1 Employ Value Engineering
4.1.2 Be Consistent with EA
4.1.3 Meet CEAA
4.1.4 Promote Nexus
4.1.5 Encourage Sustainability
4.1.5.1 Use Durable Materials
4.1.6 Optimize Traffic Flow
4.1.6.1 Promote Wayfinding
4.2 Accommodate Unforeseen Events
4.2.1 Optimize Flexibility
4.3 Integrate with City Traffic
4.4 Create Positive Appearance
4.4.1 Integrate with Urban Design Guidelines
4.5 Provide Accessibility
4.4.2 Resonate with Existing Buildings
4.6 Minimize Disruption
MMM GROUP
FAITHFUL GOULD

Functional Performance Specification

NO.	FUNCTIONS	CRITERIA	LEVEL	FLEX	REMARKS
0	**Consolidate Commercial Operations at Frontier and Accommodate Staff to Increase Security and Efficiency of Border Operations**	**Life expectancy & functionality**	**25 years with one renovation**	**F3**	
0-1	Stay within the Footprint	Meet site plan	Meet it	F0	Require two storey building.
0-2	Incorporate Needed Design Features	FPS	Satisfy Majority	F1	
0-3	Integrate with Plaza Operations	Traffic Flow, Site Constraints	Compliance with Master Plan	F1	
0-4	Facilitate Free Flow of Goods and Travelers	Efficient Flow	Minimal delay	F1	
0-5	Provide Flexibility for Future Change	Usage Flexibility	High degree of flexibility when designing systems	F1	Based on business, government and policy changes
1	**Accommodate Operations**				
1.1	Accommodate Commercial Operations				
1.1.1	Provide Commercial Work Space	First floor in controlled area	Compliance	F0	
1.1.1.1	Provide Supervisor Offices	No. of offices	2 offices	F1	On first floor in controlled area
1.1.1.2	Provide Administrative Area	No. of work spaces	12 work spaces	F2	On first floor in controlled area
1.1.2	Support CBSA Operations				
1.1.2.1	House Meeting Rooms	Size	8 to 10 persons	F1	Boardroom table, AV equipment, voice and data outlets for 8 to 10 people
1.1.2.2	House Lunch/Break Room	Size	2 tables of 4	F1	Need fridge, vending machines, TV, fridge, microwave, sink, counter and cupboards
1.1.2.3	House IT	CRA standards to serve the entire site as NCC, type of equipment	5 cabinets (30 by 42 inch) with sufficient room to walk around the cabinets, for cooling and ventilation systems and lab bench (6 ft by 3 ft)	F1	This becomes the main communication room for the site. Need RCR on 1st floor and NCC on 2nd floor. Lockable doors. Spec. to be provided

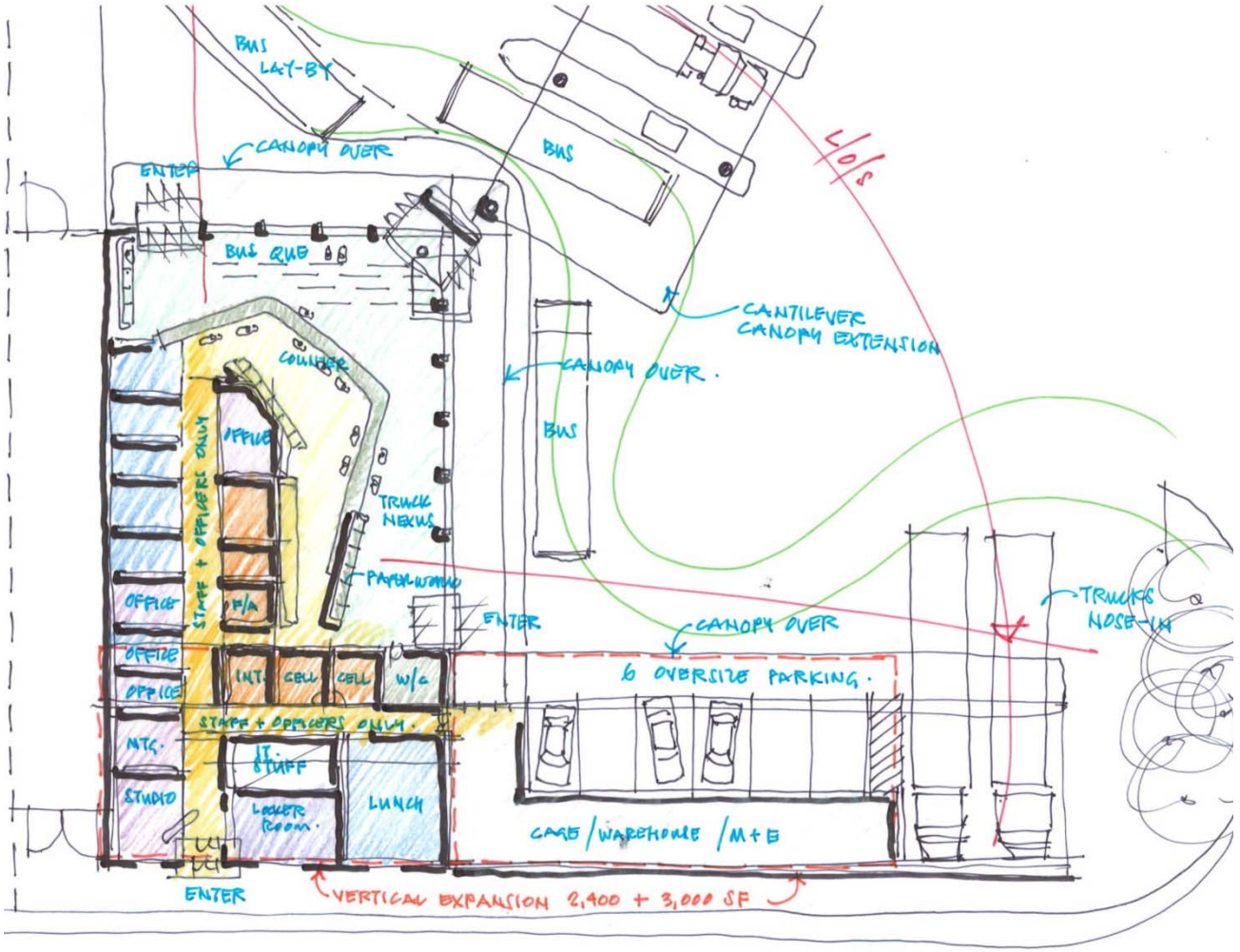
Post FPS Workshop: Base Case Development

- Using the FPS, Architects developed the following for the new CBSA OSCPC:
  - Base Case Design
  - Draft Area Summary Sheets
  - Draft Space Data Sheets
  - Alternative 1

Base Case – One Storey Building

- Order of Magnitude Cost Estimate:

  - Building: $1.98M
  - Canopies: $0.17M
  - Total: $2.15 M



Area Summary Sheets

	room #	Space Name	capacity	area (sm)	area (sf)	Comments
		WINDSOR TUNNEL PUBLIC & OFFICE SPACES				
A1		PUBLIC ENTRANCE / SPACES				
	A1.1	Vestibule	n/a	12.0	*129*	
	A1.2	Counter & Waiting	n/a	93.0	*1,001*	
	A1.3	Bus Queuing	n/a	0.0	*0*	*part of counter & waiting area*
	A1.4	Cashier	n/a	0.0	*0*	*part of counter & waiting area*
	A1.5	Public Male Washroom	n/a	5.0	*54*	*barrier free*
	A1.6	Public Female Washroom	n/a	5.0	*54*	*barrier free*
B1		SECURITY				
	B1.1	Interview Room	n/a	15.0	*161*	
	B1.2	Radio Equipment	n/a	10.0	*108*	
	B1.3	Detention Facility	2	20.0	*215*	
	B1.4	Hold Goods Room	n/a	11.0	*118*	
	B1.5	Firearm Storage	n/a	11.0	*118*	
	B1.6	Equipment Room	n/a	13.0	*140*	
	B1.7	Eye wash station	n/a	2.0	*22*	
	B1.8	Evidence Locker Room	n/a	15.0	*161*	
	B1.9	Network Communications Centre	n/a		*0*	*part of evidence Locker room?*
	B1.10	Quarantine Cage	n/a	10.0	*108*	
	B1.11	First Aid Room	1	11.0	*118*	

SPACE DATA

WINDSOR TUNNEL PLAZA
space # A1.2

space name:	**Counter, Queuing & Waiting**			**space:**	**A1.2**		
net area:	190.0	sm	2045	sf	**ceiling height:**	2.6 m	9 ft
function:	Bus clearance, commercial truck clearance (business centre), nexus, cashier Queuing for bus passengers, kiosk (2), ability for 3rd line at counter (counter kiosk), miminal seating for waiting.						
adjacencies:	Vestibule, public washrooms,				**hours of use:**	24 hours	
expansion:	operation will never grow beyond processing/offloading one bus at a time				**flexibility:**	queuing should be flexible	
finish: floor:	non-slip tile		ceiling:	acoustical ceiling tile		walls:	painted drywall
natural light:	X	required		not strictly required			operable windows
doors:					hardware:		
					security:		
occupants:		# of full-time	20-48	# of occasional	X	regular visitors	_ seldom
acoustics:		privacy		concentration		equipment	NC rating: 45
safety and health:		fumes		dust		fire/smoke hazards	noise and vibration
				moisture		spillage	corrosives X video surveillance
mechanical requirements:					**elec:** _		
equipment: *(attach specs)*	Large counter unit to accommodate individual & group and small counter space for completing forms. Counters to be barrier-free as required				seating area		
additional comments:	"crush" capacity 48 bus passengers, 5 bus/nexus, 1 broker, line of sight across, visibility, openness space for discreet secondary luggage examination immediately adjacent to kiosk						
date prepared:	*Oct. 15.07*	per:	*C. Nguyen*		revised:	*Oct.17.07*	per: *FPS.VE team*

VE Objectives

- City of Windsor and Transport Canada
  - Best facility to accommodate traffic
- CBSA and Transport Canada
  - Identify and characterize necessary functions to be provided by the conceptual design of the CBSA OSCPC; and
  - Begin building consensus among the many stakeholders of this important project.
- MTO
  - Fit within the overall Master Planning Study

Summary of Creative Ideas

No. of Ideas Identified	System	No. of VE Proposals	No. of Design Suggestions	No. of Design Requirements	No. of Ideas Developed with Others
48	Secure Area	21	14	4	2
14	Public Spaces	2	5	0	1
26	Site	12	3	0	0
88	Summary	35	22	4	3

Design Requirements

SA-26	Ensure lighting is recessed in detention cells
SA-27	Used epoxy coated floors in detention cells
SA-28	Video surveillance inside and outside detention cells
SA-36	Lockable safe and monitoring equipment in commercial supervisors office

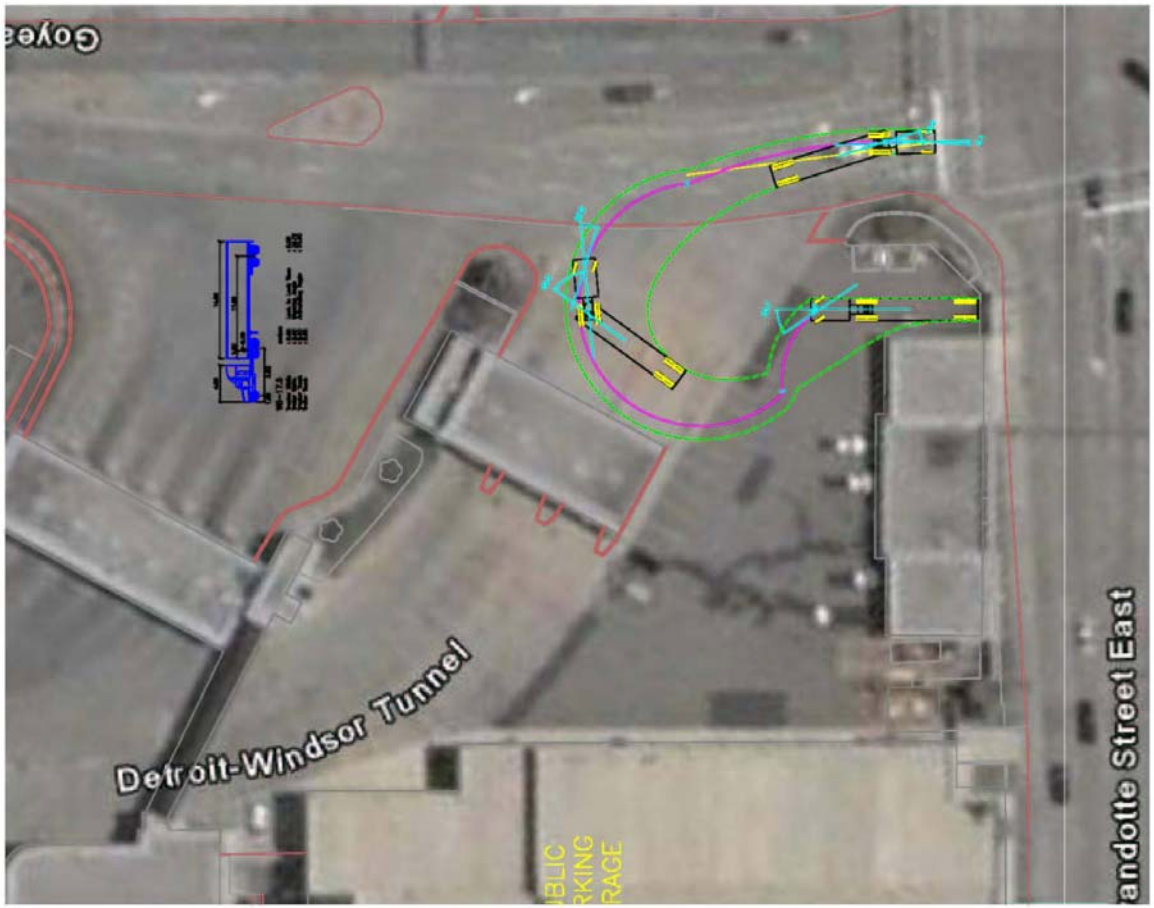
Design Requirements cont'd

Idea No.	Description	SF Impact	$ Impact
SA-3	Combine the radio equipment room with another space	-90	-$13, 800
SA-8	118 sq ft hold goods room (includes evidence locker room)	-161	-$24, 700
SA-9	Lockable gun storage in lockers vs fire arm storage room (becomes 2nd interview room)	0	$0
SA-10	Tool cabinet at dock in lieu of equipment room	0	$0
SA-11	Reduce the size of the first aid room	-58	-$8, 900
SA-17	Eliminate staff entrance vestibule	-86	-$13, 200
SA-19	Increase the IT and lab room to 200 sq ft (includes all services such as security cameras)	+39	+$9, 200
SA-21	Reduce the size of the lunch room	-174	-$26, 700
SA-47	Larger office for commercial supervisor	-108	-$16, 400
SA-48	Two cabinets in lieu of office supply storage room	+21	+$3, 200

SA-13:Include 10m^2 (108 ft^2) Cable Entry and Miscellaneous Communications Room

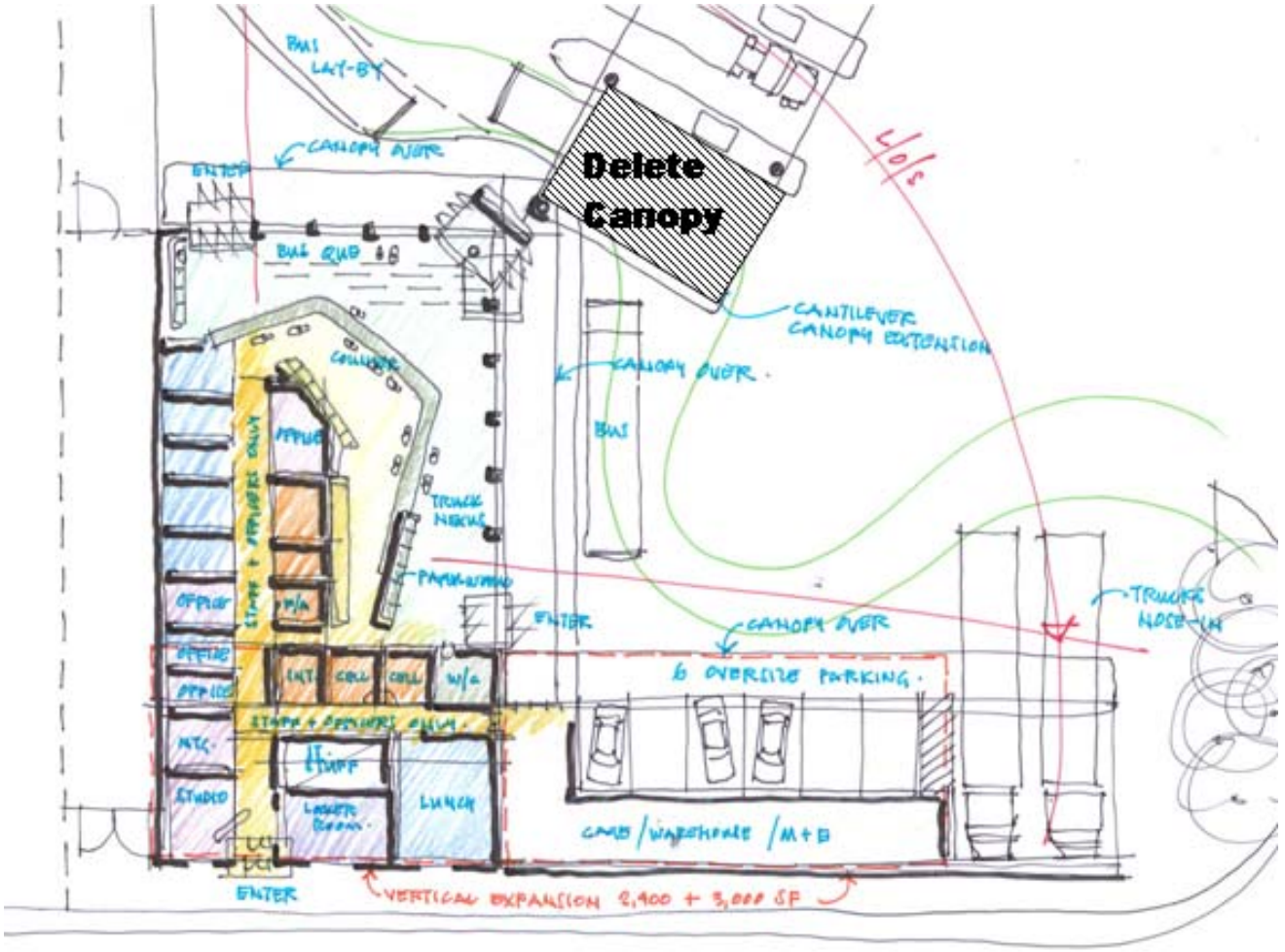
- **Alternative Design**:
  - The proposal would be to construct a separate room for termination and splicing of Telecom Carrier and other 3rd Party Cables requiring
  - This room would also be used to house all Non CBSA IT and Telecom Equipment.
  - This would increase the overall program space by 10m2 (108 ft2).
- **Advantages of Change**:
  - This provides the physical separation of CBSA equipment from other service providers which is an identified requirement
- **Disadvantages of Change**:
  - Additional Program Space
- **Estimated Additional Capital Cost: $16,567**

Truck Maneuvering Simulation



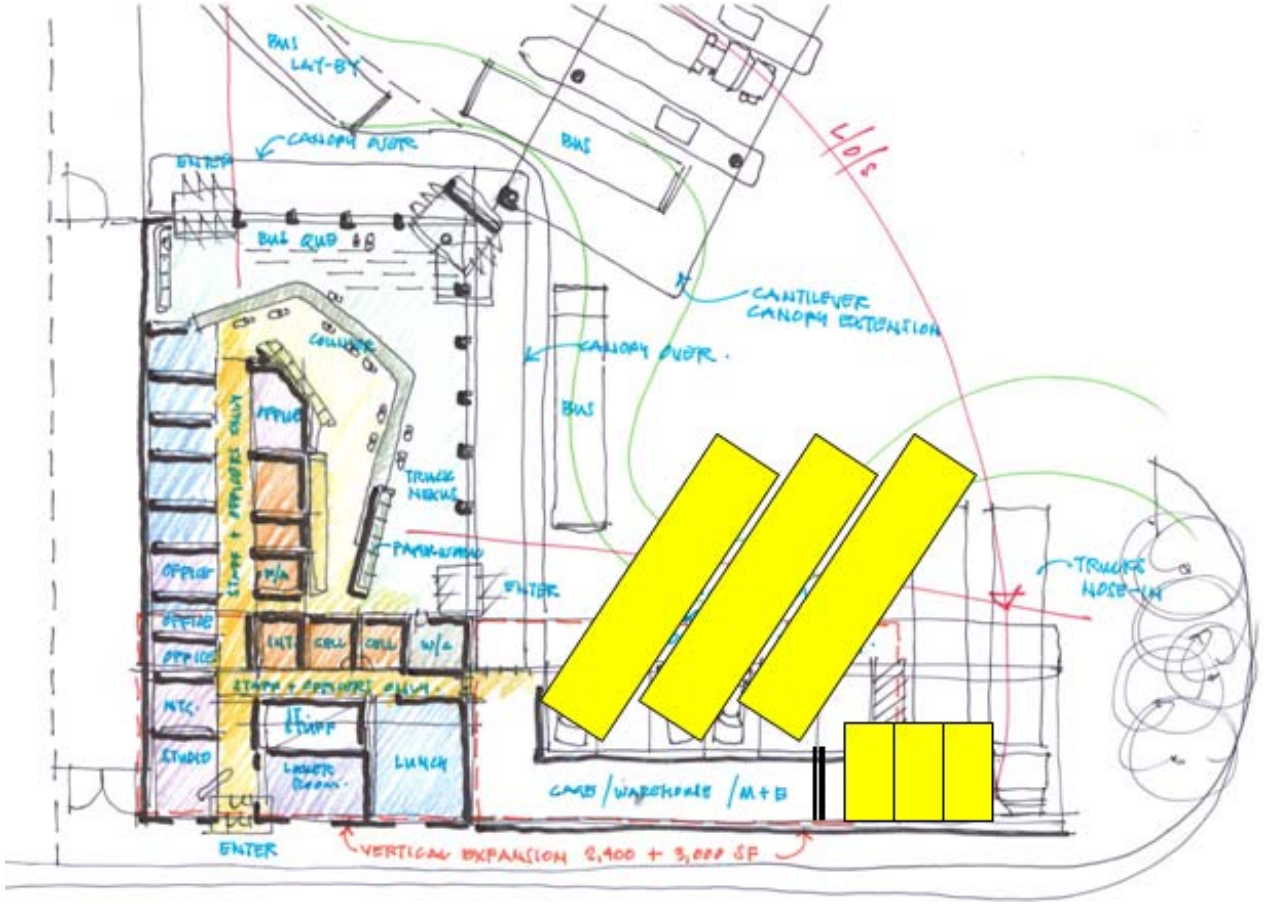
S-9: Remove the canopy extension to the main building

- Estimated Capital Cost Savings:
  - $46,375



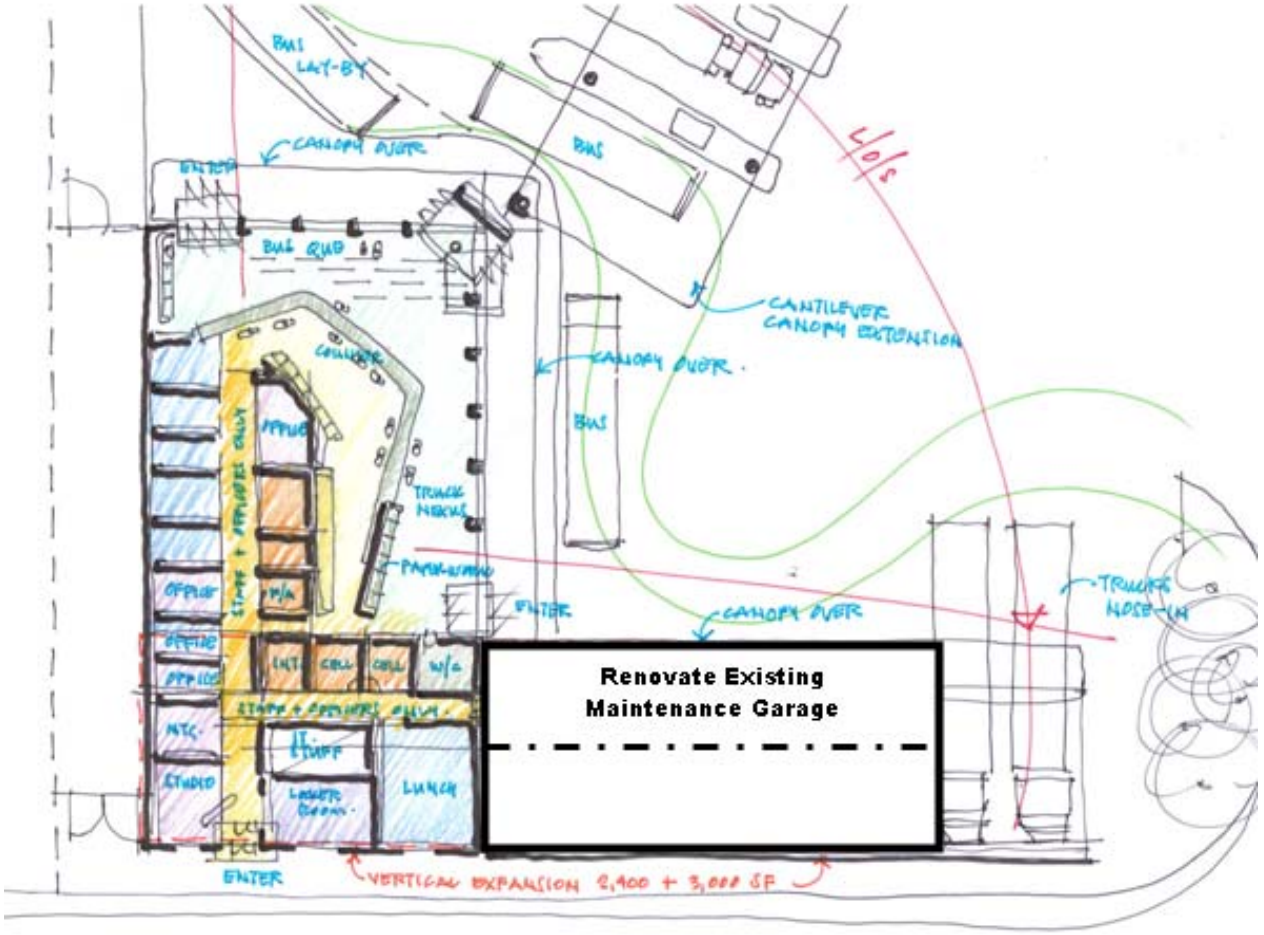
S-19: Provide 3rd Truck Slot with One Closest to the Building Also Used For Nexus

- Estimated Capital Cost Savings:
  - $31,870



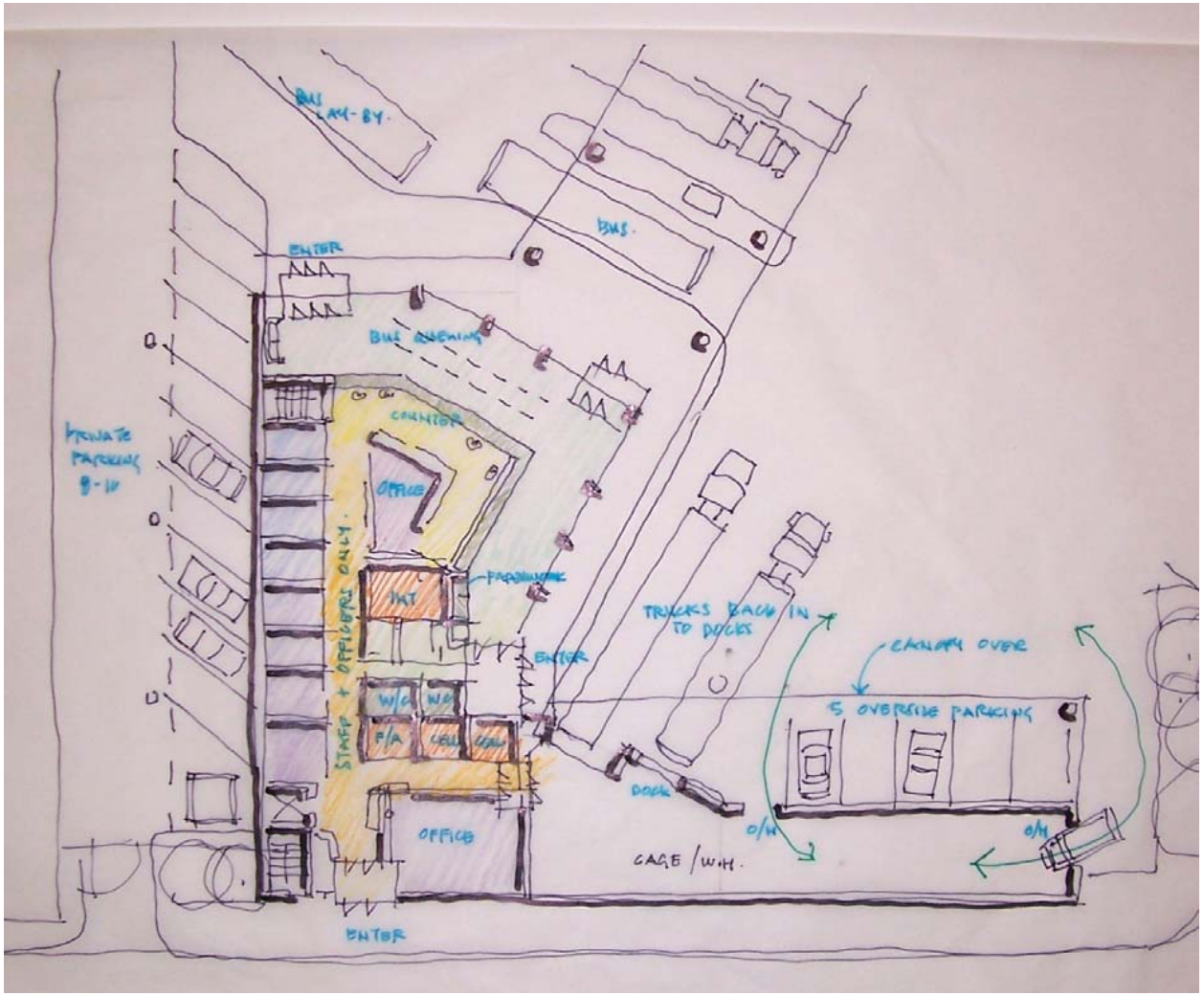
S-24: Keep 5 Bays in Existing Maintenance Facility as Warehouse Space

- Estimated Capital Cost Savings:
  - $150,094



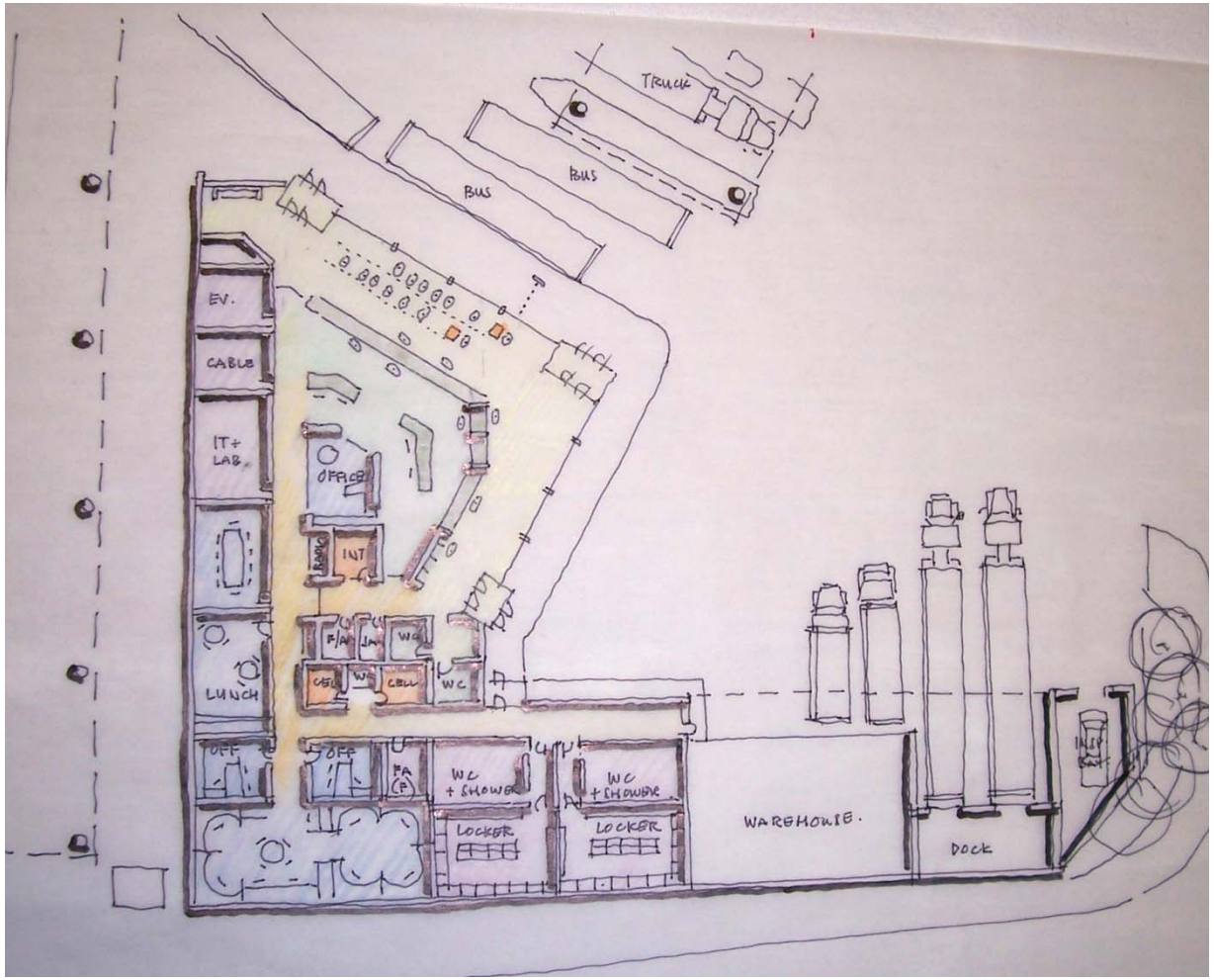
S-26: Option 2 (Two Storey)

- Order of Magnitude Cost Estimate:
  - Building: $2.26M
  - Canopies: 0.14M
  - Total: $2.4 M



S-21: Option 3 (One Storey)

- Order of Magnitude Cost Estimate:
  - Building: $2.18M
  - Canopies: 0.13M
  - Total: $2.31M
  - Optional Inspection Bay is an additional $0.89M



Questions

For Further Information:

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