Appendix G

Dallas LFMP Ticketing Hall Simulation

LOVE FIELD

MODERNIZATION

181354

1.1 Goals and Metrics

Table 1: Passenger Wait Time Performance Goals

Facility Type	95th (minutes)	Max (minutes)
Full Service Agents	10.0	15.0
Inline Kiosks	5.0	15.0
Bag Drops	5.0	15.0
Boarding Pass Only Kiosks	3.0	15.0
Skycaps	10.0	15.0

Table 2: Passenger Queuing Space Performance Goals

LOS	A	B	C	D	E
Sq ft/Pax Cut off	19.4	16.2	14.0	12.9	11.8
# of Pax Cut off for Combined Queue Space (Lobby)	160	192	222	241	263

1.2 Goals and Metrics

Table 3: Metrics comparison

	TARPS		Original Design (DD)		2 Pod Design (VE)		Modified Design ***	
	Touch Points	Stats	Touch Points	Stats	Touch Points	Stats	Touch Points	Stats
Southwest Airlines	**56**		**56**		**56**		**56**	
Group Size		Not Indentified		1.31 pax/group		1.31 pax/group		1.14 pax/group
SWA Full Service Agent	8	2.77 min	8	2.77 min	8	2.77 min	10	3.42 min
SWA In Line Kiosk (at belt)	42 **	2.30 min	18	2.98 min	10	2.98 min	8	1.50 min
SWA Bag Drop (at belt)			10	1.08 min		1.08 min	8	1.08 min
* SWA Boarding Pass Only Kiosk			14	0.66 min	32	0.66 min	24	0.66 min
SWA Curbside	6	Not Indentified	6	2.00 min	6	2.00 min	6	1.82 min
Other Airlines	**16**		**16**		**16**		**16**	
OAL Full Service Agent	4	2.77 min	4	2.77 min	4	2.77 min	4	2.77 min
OAL Kiosk (at belt)	10	2.30 min	10	2.30 min	10	2.30 min	10	2.30 min
OAL Curbside	2	Not Indentified	2	Assumed SWA	2	Assumed SWA	2	Assumed SWA
TOTALS	**72**		**72**		**72**		**72**	

Notes

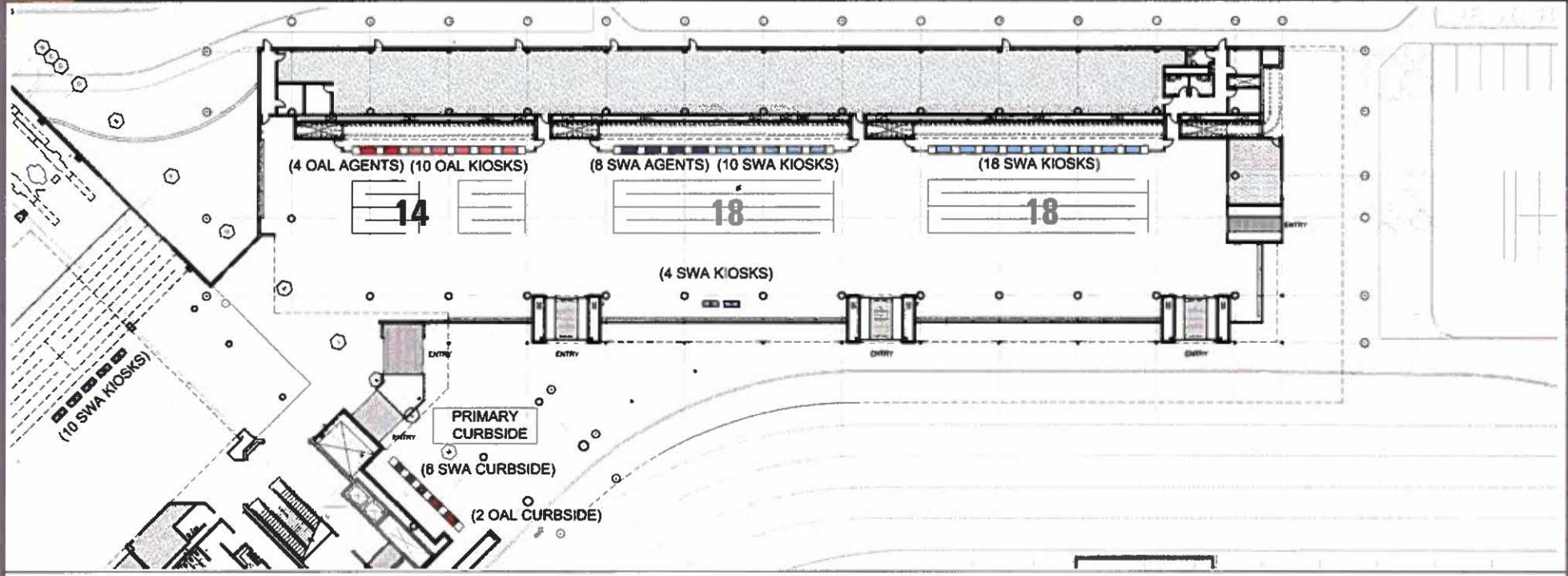
* These numbers do not influence ticketing hall size, can be located anywhere in passenger flow

** TARPS / SD Report did not distinguish between in-line and remote kiosks

*** Incorporates up to date processing rates and touch point requirements based upon current trends in ticketing

LOVEFIELD MODERNIZATION

2.1 Original Three Pod Design



Notes

1. Original design based upon TARPS metrics and touch point requirements
2. Not seen as reflective of current industry trends

Performance

1. Achieves LOS A at all times in all areas
2. Excellent level of performance based upon numbers of touch points at the belt

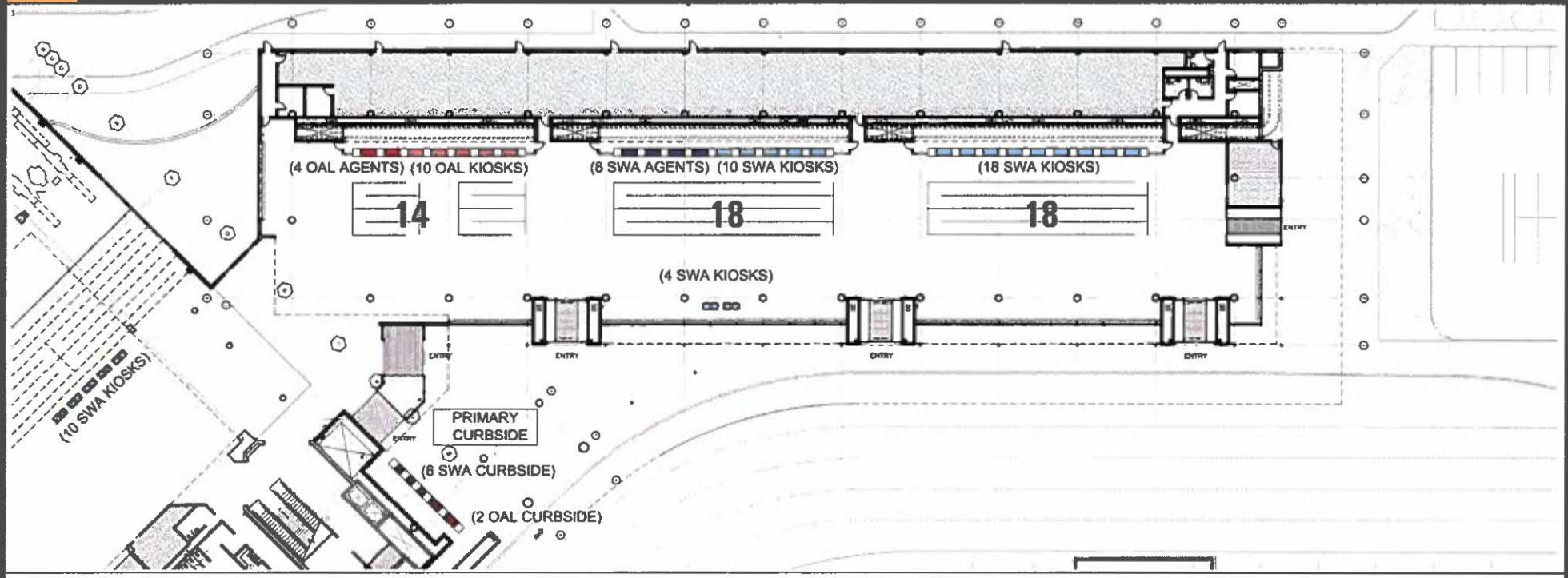
LEGEND
OAL AGENTS
OAL KIOSKS
SWA AGENTS
SWA KIOSKS

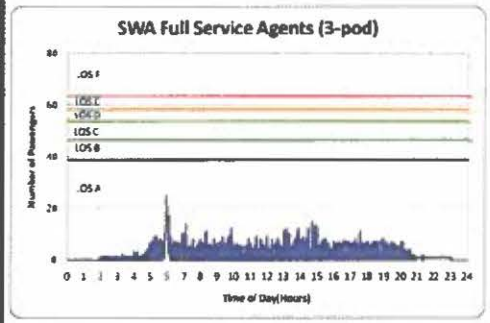
TOUCH POINT COUNTS			
		DESIGN DEVELOPMENT	
OAL	AGENT	4	
	KIOSK	10	
	CURBSIDE	2	
SWA	AGENT	8	
	KIOSK	42	
	CURBSIDE	6	
TOTAL		72	

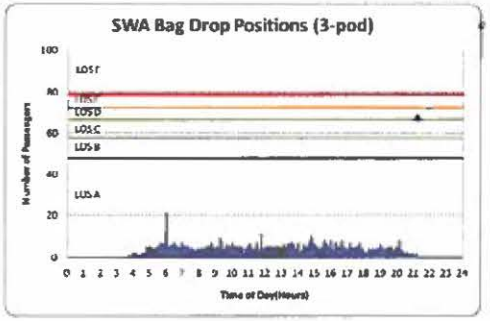
SQUARE FOOTAGE			
	DD SF	STUDY SF	REDUCTION
TICKETING HALL	44,049 SF	-	-
TICKETING SUPPPORT	8,214 SF	-	-

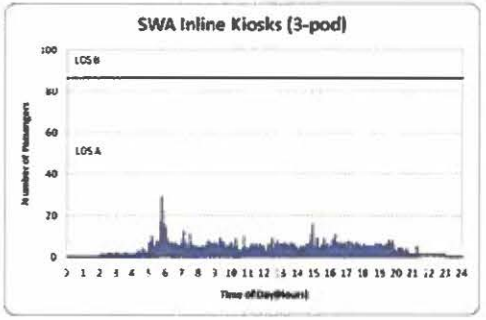
LOVEFIELD MODERNIZATION

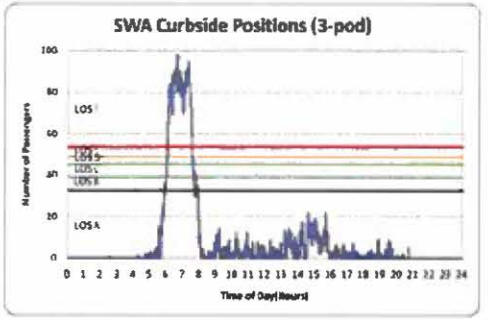
2.2 Original Three Pod Design





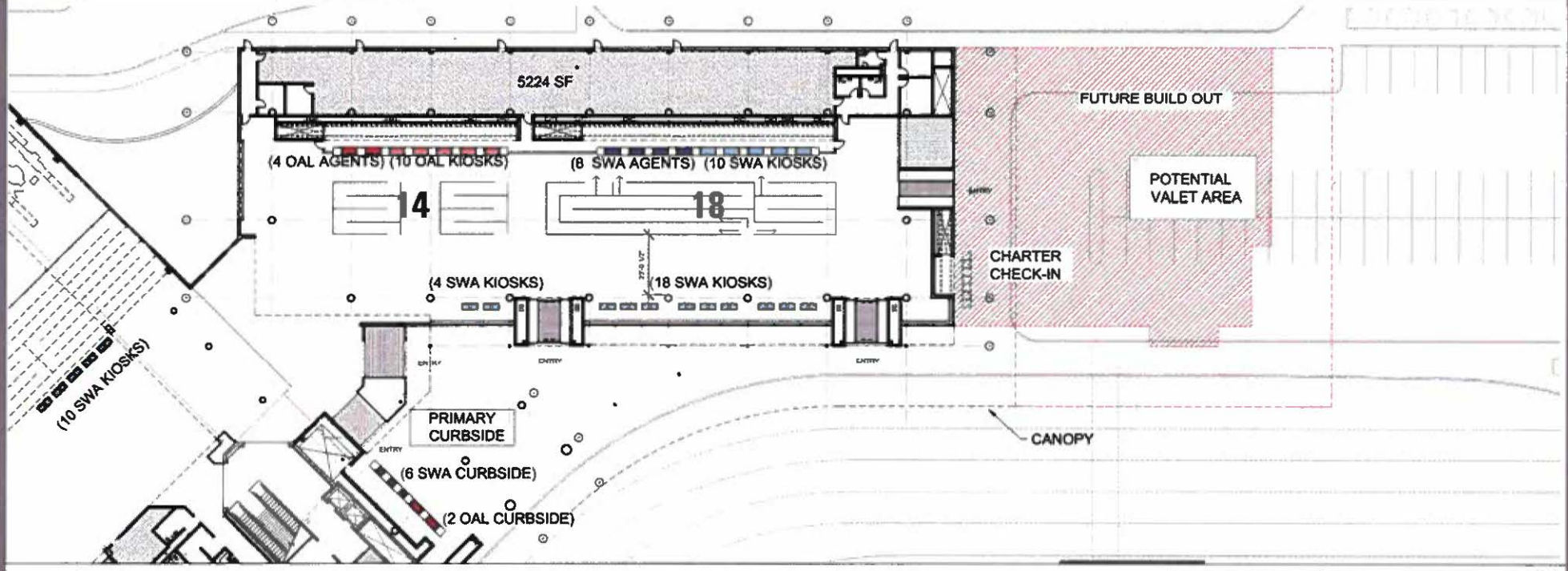






LOVEFIELD MODERNIZATION

3.1 Two Pod (VE Idea)



Notes

1. Attempt to eliminate one full pod as a cost savings measure
2. Also removed the East tunnel from the lower level roadway
3. Maintained TARPS metrics but shifted balance of kiosk activity away from belt
4. Reduces hall by approximately 27% in size and $3.5M in cost
5. Reduction in effective curb length but does not exceed acceptable level of service

Performance

1. Performs at LOS F at all times in all areas
2. Failure based upon lack of touch points at the belt

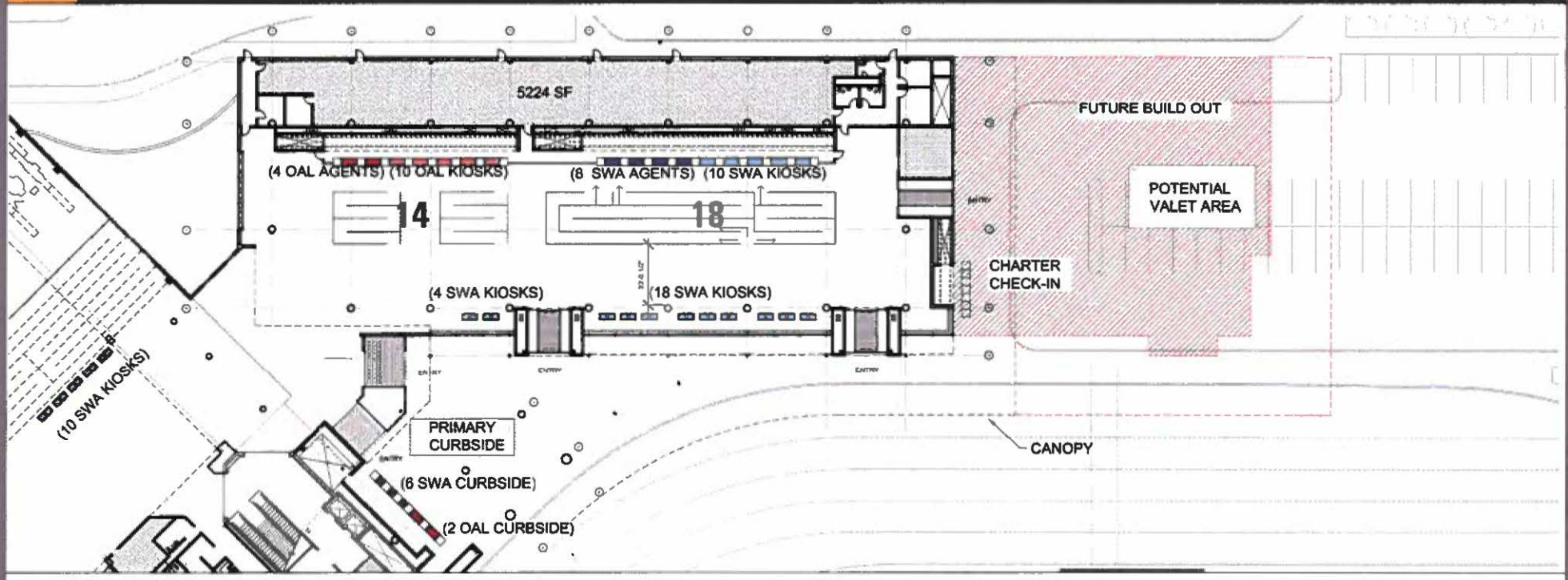
LEGEND
OAL AGENTS
OAL KIOSKS
SWA AGENTS
SWA KIOSKS

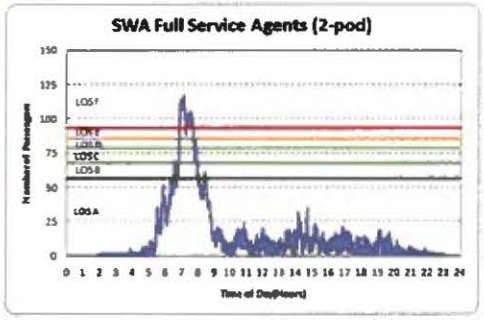
TOUCH POINT COUNTS		DESIGN DEVELOPMENT	ALTERNATE OPTIONS
OAL	AGENT	4	4
	KIOSK	10	10
	CURBSIDE	2	2
SWA	AGENT	8	8
	KIOSK	42	42
	CURBSIDE	6	6
TOTAL		72	72

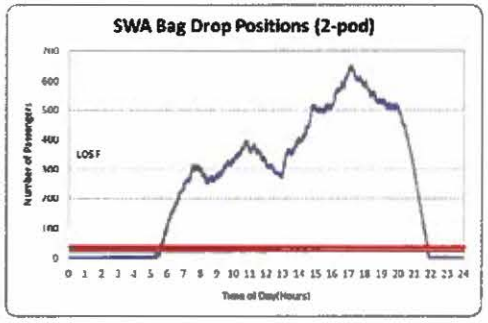
SQUARE FOOTAGE	DD SF	STUDY SF	REDUCTION
TICKETING HALL	44,049 SF	31,386 SF	12,663 SF
TICKETING SUPPPORT	8,214 SF	5,224 SF	2,990 SF

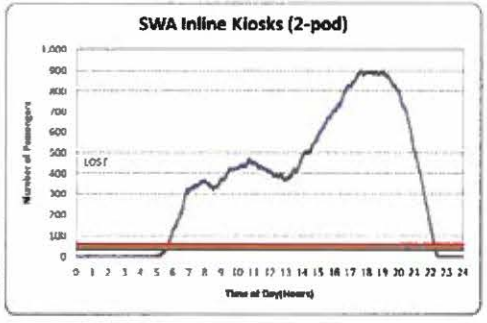
LOVEFIELD MODERNIZATION

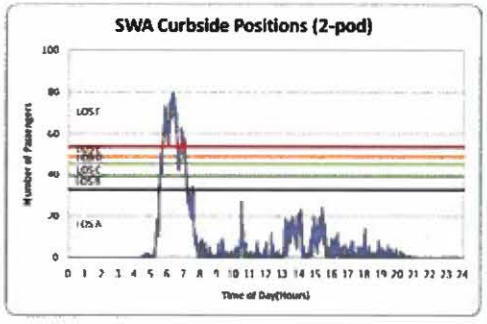
3.2 Two Pod (VE Idea)





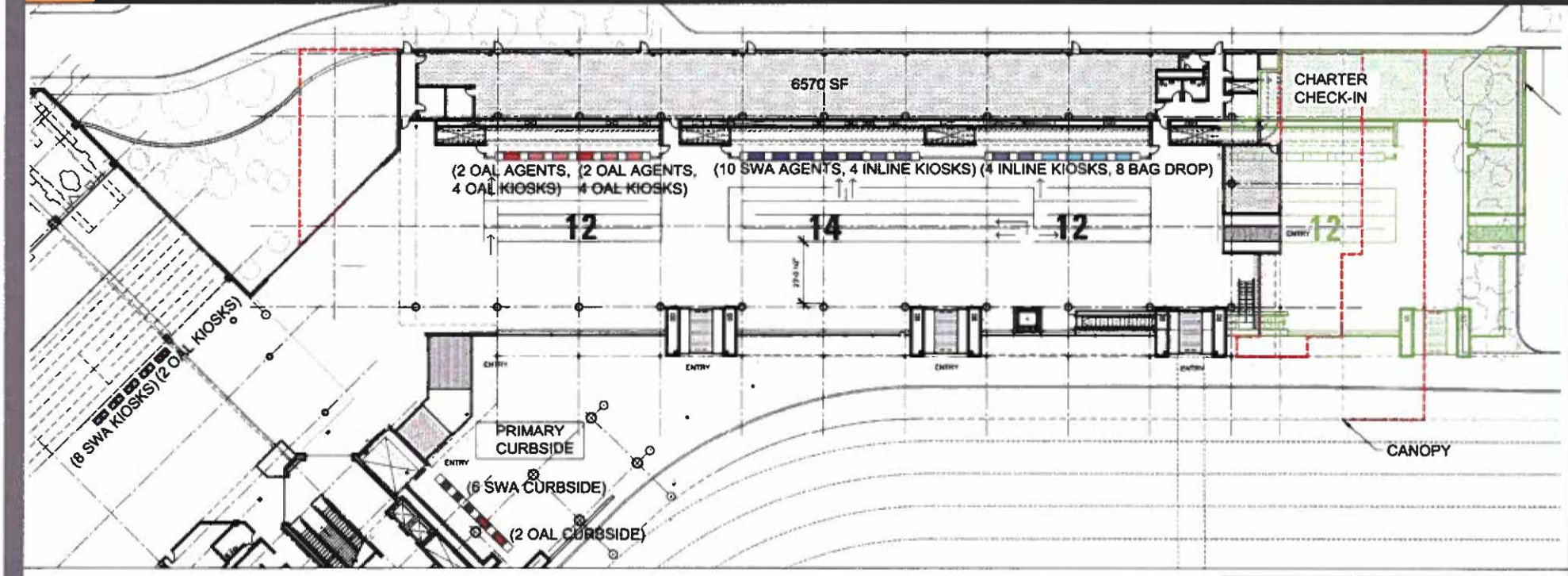






LOVEFIELD MODERNIZATION

4.1 Modified Three Pod



Notes

1. Uses modified Full Service and Kiosk processing times provided by SWA, maintains 3 takeaway belts
2. Reduces hall by approximately 15% in size and $2M in cost
3. Provides for future 4th pod to be added without additional BHS cost or basement construction
4. Minimal reduction in effective curb length with no measurable impact to roadway LOS
5. The location of an additional 16 boarding pass only kiosks is TBD

Performance

1. Performs at LOS A with 80% load factor
2. Opening day build-out allows for growth to 85% load factor without reducing LOS past C

LEGEND

- OAL AGENTS
- OAL KIOSKS
- SWA FULL SERVICE AGENTS
- SWA EXPRESS BAG DROP
- SWA IN LINE KIOSKS
- SWA BOARDING PASS ONLY KIOSKS
- DD OUTLINE
- FUTURE EXPANSION

TOUCH POINT COUNTS

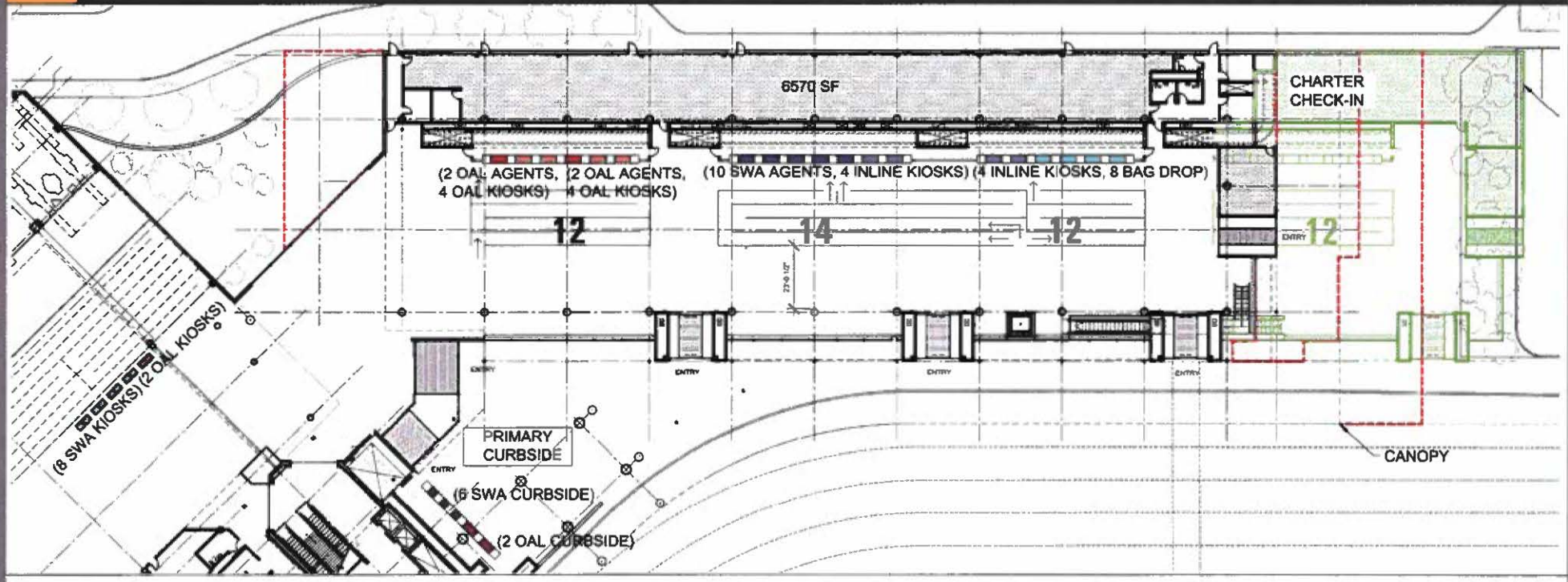
			DESIGN DEVELOPMENT	3 POD OPTION
OAL	AGENT		4	12
	KIOSK		16	2
	CURBSIDE		2	2
SWA	AGENT		8	24
	KIOSK		42	8
	CURBSIDE		6	6
TOTAL			72	54

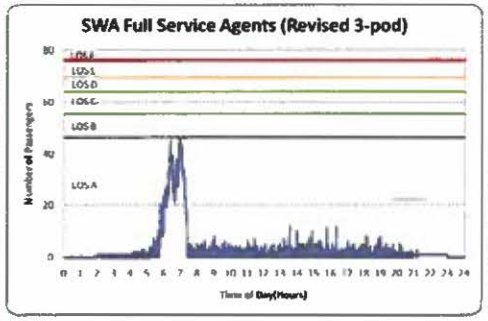
SQUARE FOOTAGE

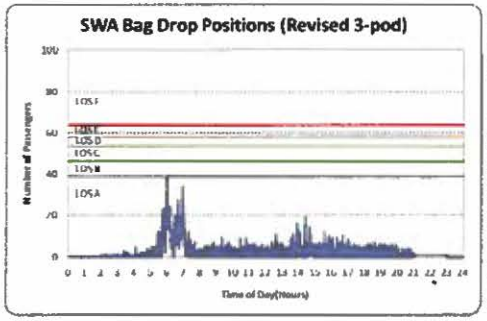
	DD SF	3 POD SF	REDUCTION
TICKETING HALL	44,049 SF	38,907 SF	5,142 SF
TICKETING SUPPPORT	8,214 SF	6,370 SF	1,844 SF

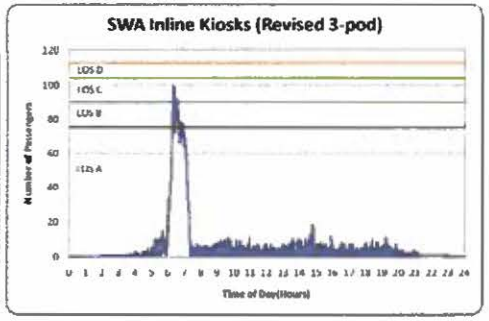
LOVEFIELD MODERNIZATION

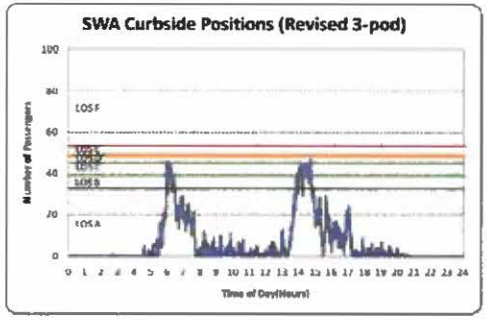
4.2 Modified Three Pod











4.3 Modified Three Pod

Table 5: Scenario Performance

Scenario (TKT:KSK:EBD)	Load Factor	Full Service (Minutes)		Inline Kiosks (Minutes)		Bag Drops (Minutes)		Skycaps (Minutes)		Max Lobby Combined Queue	LOS
		95%	Max	95%	Max	95%	Max	95%	Max		
8:8:8	80%	15.96	27.05	2.31	7.77	2.29	5.76	11.59	21.68	165	B
10:7:7	80%	10.62	21.36	5.49	16.21	6.37	18.22	11.58	21.66	216	C
10:8:8	80%	4.14	12.49	1.65	5.24	1.66	4.74	11.60	21.75	97	A
10:8:8, Curbside into Lobby	80%	5.01	13.92	2.21	13.56	1.67	5.36	8.08	12.41	149	A
10:8:8, Curbside into Lobby	85%	10.80	21.88	6.42	16.41	4.26	8.93	9.56	16.44	199	C

Assumes equilibrium achieved between skycap and lobby

Accommodation for growth of the peak departure bank

5 Summary

Notes:

1. The ticketing hall size is driven by the peak hour departure demand
2. The adopted future flight schedule for this project shows a peak departure hour demand of approximately 2,200 passengers
3. This demand is consistent for both the opening day and the ultimate flight schedules, ie, future growth is achieved by increasing non-peak flight activity
4. We do not anticipate any significant increase in the peak departure hour demand. Things that could effect the peak departure demand include:
    a. Number of gates (cannot increase due to FPA)
    b. Aircraft turn times (No industry precedent from any major airline for sustained turn times in excess of those shown in adopted flight schedules)
    c. Aircraft gauge (if aircraft gauge increases then turn times decrease, they are inversely relative)
    d. Load factor (this factor is self-regulated by the industry through fleet size and flight schedules, however some fluctuation is reasonably expected)
5. We do expect future changes in airline processing and business practices that could decrease the demand in the ticketing hall even further, these include:
    a. Increase in self service devices and decrease in full agent positions
    b. Growing familiarity of the travelling public with new technologies and practices
6. The guiding factor for ticket hall size will continue to be the number of bags that passengers check, and the space needed to perform that function

Design Team Recommendations:

1. We recommend adopting the Modified 3 Pod layout as shown on page 4.1
    a. This layout accommodates the opening day and ultimate flight schedule activity levels at or below LOS C at TARPS load factors
    b. This concept allows for future expansion of one additional pod (12 positions) with minimal BHS and basement work required
2. We recommend maintaining the East Tunnel access directly into the ticketing hall

Next Steps:

1. Review this information with the DOA, gain consensus on direction, confirm no conflict or impact to PFC application
2. Authorize the design team to proceed with CD's based on the Modified 3 Pod scheme
3. After ticketing hall size is tied down, continue refinement process with SWA Lobby of the Future and DOA

Note: Currently no work is being done on the ticketing hall CD's, deadline for direction to design team was last Friday, day for day delay until direction is given

181354

DALLAS AIRPORT SYSTEM

URS
PROGRAM MANAGEMENT OFFICE
7710 AVIATION PLACE, SUITE 200
DALLAS TX 75235

Memo

To: Dan Weber, Diego Rincon, Terry Mitchell, Kenneth Gwyn, Cliff York, Wade Ellison

From: Karen Kavanagh

CC: Johnny McKnight, Jamey Tasker, Marty Tasker, Manoj Patel

Date: 5/25/2015

Re: Reduction in Ticket Hall Size - Simulation Results

The VE idea that reduced the Ticket Hall size by one-third in order to save $3.5 M resulted in LOS F and was determined to not be feasible. At the request of SWA, Corgan subsequently developed a modified design for the Ticket Hall which included a 15% reduction in overall size, while maintaining three ticketing pods and meeting other TARPS metrics. TransSolutions ran the simulation for this design to determine the Level of Service (LOS) that would be achieved with this option.

The attached PPT, prepared by Corgan, provides a comparison of three options: 1) Original DD layout, 2) Recent VE Option with two ticketing pods and one-third reduction in size, and 3) Modified three-pod design and approximately 15% reduction in size. Results indicate the LOS for the Modified Three-pod sized ticket hall will remain at LOS A through-out the planning period (2024), and provides for future expansion that is driven by demand (PPT - pages 7-9).

Because the PFC Application was approved based on a detailed Significant Contribution which focused on LOS, we informally reviewed this option with FAA Southwest Region. They have agreed to this VE option that reduces the Ticketing Hall by approximately 15% provided the following parameters are met:

1. **The LOS for the project does not go below a Level of Service (LOS) C throughout the projected life of the program (2024).**
    a. The simulation of the ticketing hall, after the reduction, showed an overall LOS of A (with the exception of the curbside) with 80% load factors through 2024.
    b. The proposed deferred reduction maintains an overall level of service C with 85% load factors through 2024.
    Note: 2024 is the horizon used by the FAA in the significant contribution analysis.

2. **The FAA will require that all of the PFC funds allocated to the project are used in accordance with the eligibility of the project.**
    a. The project has a PFC eligibility of greater than 50%. The current funding plan for the Terminal allocates only 25% of the funds coming from PFCs.

3. **The project will also need to maintain expansion space of 15% for future growth.**
    a. This will be labeled as "Demand- driven" expansion on the final drawings.

Currently the project is on track to meet all 3 parameters required by the FAA and we concur with the recommended VE option.

It is anticipated that the PMT will recommend to the Steering Committee to accept the VE Option reducing the Ticket Hall by 15%, realizing approximately $2 million in cost savings. If the Steering Committee accepts this option, DOA should inform the FAA of the modified design and specifically address the 3 parameters.

Please let me know if you have any additional questions.

DALLAS AIRPORT SYSTEM

URS
PROGRAM MANAGEMENT OFFICE
7710 AVIATION PLACE, SUITE 200
DALLAS TX 75235

15% Reduction in Ticketing Hall Size

The FAA Southwest Region, has agreed to a VE option that reduces the Ticketing Hall by approximately 15% (see attached drawing) provided the following parameters are met:

1. **The LOS for the project does not go below a Level of Service (LOS) C throughout the projected life of the program (2024).**
   a. The simulation of the ticketing hall, after the reduction, showed an overall LOS of A (with the exception of the curbside) with 80% load factors through 2024.
   b. The proposed deferred reduction maintains an overall level of service C with 85% load factors through 2024.

   Note: 2024 is the horizon that was used by the FAA in the significant contribution analysis.

2. **The FAA will require that all of the PFC funds allocated to the project are used in accordance with the eligibility of the project.**
   a. The project has a PFC eligibility of greater than 50%. The current funding plan for the Terminal allocates only 25% of the funds coming from PFCs.

3. **The project will also need to leave room for potential finish out of the 15% for future use.**
   a. This will be labeled as demand driven expansion on the final drawings.

These are the parameters that FAA requires for approval of the reduction. Currently the project is on track to meet all 3.