

Collaboration in Regional Civilian and Military Transportation Planning

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Distribution Statement A: Approved for Public Release-Unlimited Distribution

Outline of Presentation

- The Strategic Mobility 21 (SM 21) Program
- The opportunities:
 - Regional planning
 - Military transportation planning
- Approach
- The Regional Planning Web Portal
- The Military Ship and Rail Load Planning Web Portal
- Future research



Strategic Mobility 21

- R&D effort managed by ONR
- Initial focus on Southern California regions
- Joint Power Projection Support Platform (JPPSP) at the Southern California Logistics Airport (SCLA) near Victorville



Regional planning opportunity

- Long time frames
- Hidden data and assumptions
- Hidden models and analysis tools
- Few alternatives are explored and impacts of all consequences are not evaluated
- Wicked problems

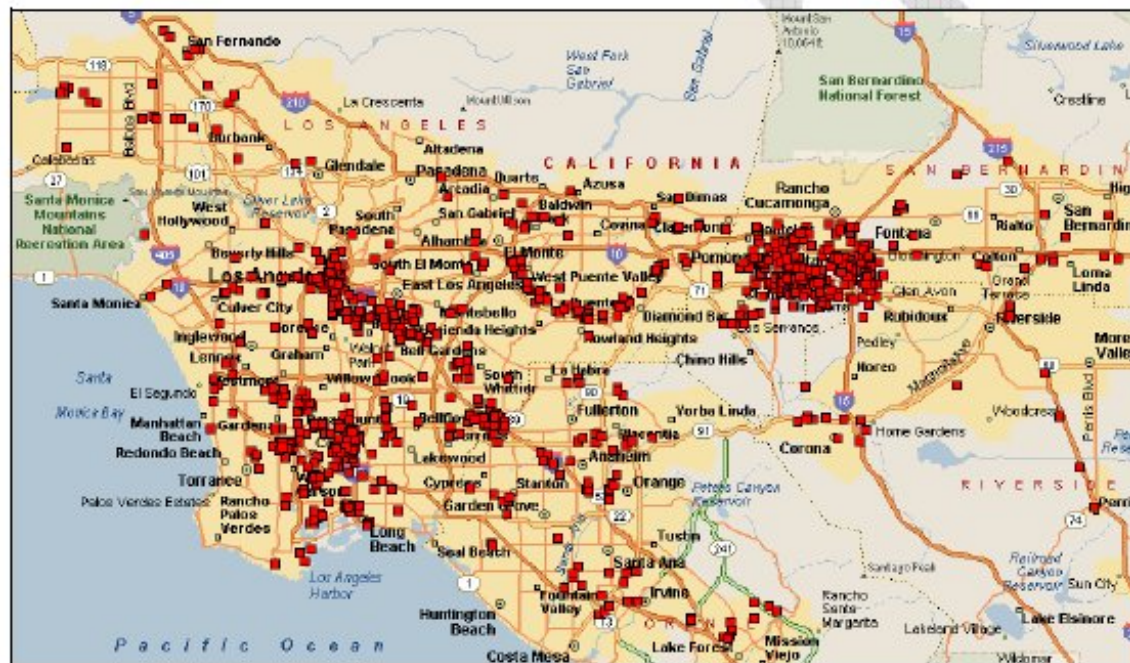
Meeting SM21 military objectives requires new dual-use infrastructure and new processes.



Example from a current report

Exhibit 12 shows the locations of over 1000 regional distribution centers (DCs). The same Ontario/Mira Loma concentration shown in the port survey data is apparent in this map. The study team developed a preliminary analysis of the potential for an inland port/rail shuttle serving this DC concentration as an indication of the overall potential of the inland port concept in reducing truck VM and emissions.

Exhibit 12: Regional Distribution Centers



Military transportation planning opportunity

- Surge deployments impact port operations
- Specific technology and process gaps to fill
- Synergy dual-use infrastructure
- Opportunity to apply commercial technology



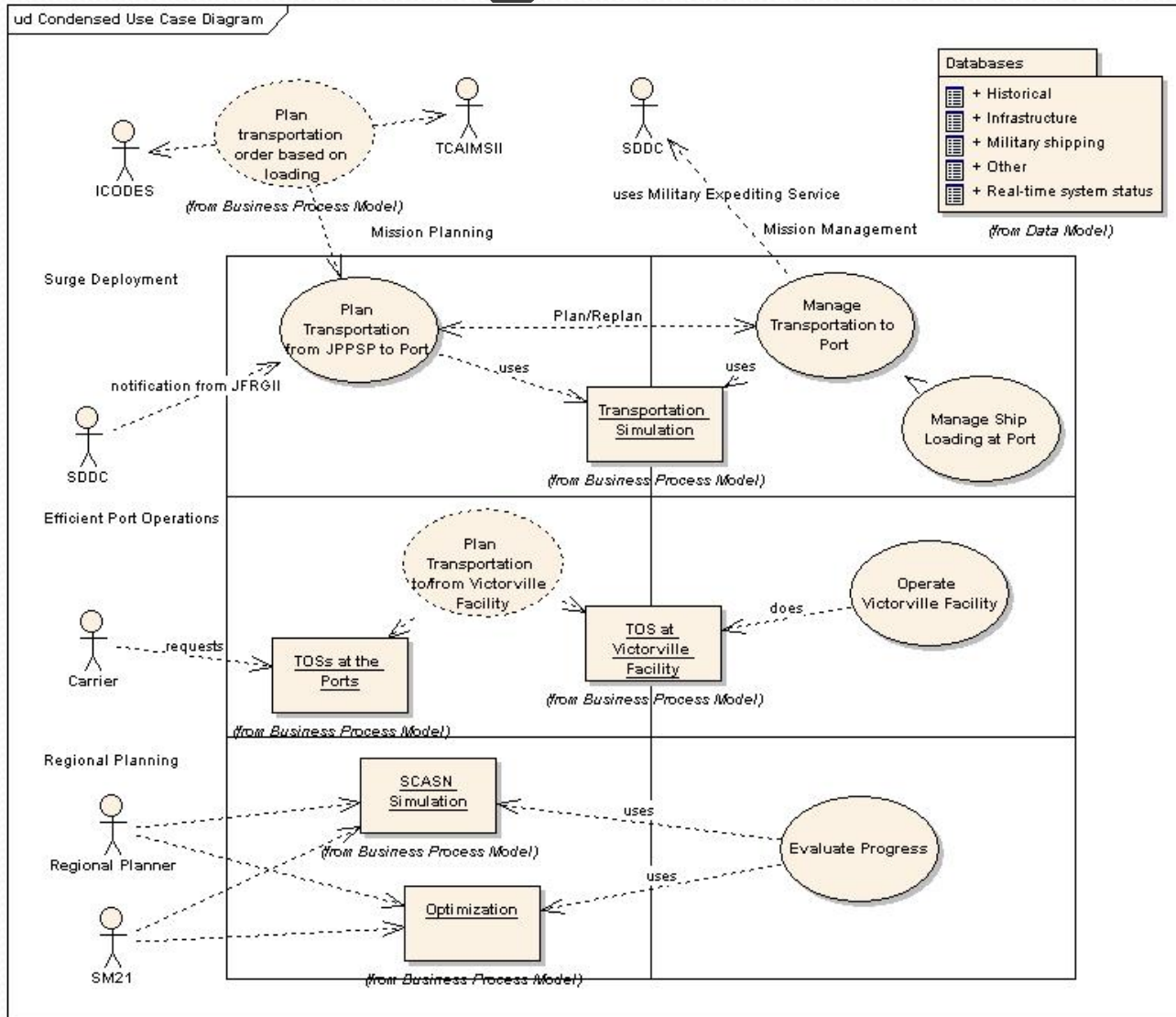
Technical approach

- State of technology
- Business process based tools orientation
- Integration of data, analysis, and presentation
- Integrated geospatial visualization
- Web based: blogs, wikis, natural data formats

“Technology for technology’s sake is nothing. It must be accompanied by skilled people and efficient processes.”

Journal of Commerce, 26 March 2007, page 52

Use case diagram



The Regional Planning Web Portal

Home - Regional Planning Team Site - Windows Internet Explorer

http://win-server-2003/Regional_Planning/default.aspx

File Edit View Favorites Tools Help

Home - Regional Planning Team Site

Home > Regional Planning

Welcome WIN-SERVER-2003\administrator

Strategic Mobility 21 Regional Planning

Home Site Actions

This is the Regional Planning Web Portal of the Strategic Mobility 21 Program.

How to use this web site

This web portal provides information and tools that support the regional planning process in the Southern California area. Features are accessed either through the "Quick Launch" bar on the left or the tabs near the top. Key features are:

1. There are active wikis (listed in "Sites" as well as in the top bar) and Discussions devoted to special topics. At present there are two of these, both devoted to the design of this web portal.
2. The "Wikipedia" is an encyclopedia of concepts and terminology concerning logistics and transportation. These are the basis for all aspects of the design of this web site, and especially its Modeling, Simulation, and Analysis features.
3. The SM21 "Stakeholders" wiki library contains articles about stakeholders of the SM21 Program. These articles include information gathered from stakeholders during interviews.
4. The SM21 "Modeling, Simulation, and Analysis" (MSA) area gives you access to a collection of data relevant to studying regional planning issues in the Southern California area. This information is organized and defined based on the concepts in the SM21 Wikipedia. Most information is viewable as lists or spreadsheets. Some information may also be viewed graphically.

Announcements

Regional Planning Web Portal becomes operational. 2/12/2007 5:51 PM
by administrator

The Regional Planning Web Portal has been activated on the SM21 Server in Victorville. The initial site already contains useful content, however much more will be added over the next two and a half months.

Add new announcement

Calendar

There are currently no upcoming events. To add a new event, click "Add new event" below.

Add new event

Links

Link to the home of the company that created this site.

Add new link

Site Hierarchy

- Connections
- Libraries
- Locations and Objects
- Maps
- Networks
- Optimization
- Shared Documents
- Transportation Status
- AIDC Data
- Announcements
- Calendar
- Links
- Modeling, Simulation, and Analysis
- Stakeholders
- Tasks
- Wikipedia
- Regional Planning Wiki Design
- Team Discussion



Example: stakeholder data

The screenshot shows a web browser window with the address bar displaying 'Regional Planning Team Site - Shipping Lines'. The page title is 'Regional Planning Team Site'. The main content area is titled 'Shipping Lines' and contains the following information:

Much of this information is from the Southern California Ports Handbook, 2006-2007, published by the Marine Exchange of Southern California, www.mxsocial.org

[The top 40 shipping lines in terms of US exports.](#)

[The top 40 shipping lines in terms of US imports.](#)

American President Lines Ltd.
614 Terminal Way
Terminal Island, CA 90731
Phone: (310) 548-8700
Fax: (310) 548-8900
Website: www.apl.com
Addtl. Information:
San Pedro Terminal Operations

Andover (USA) Inc.
1800 E. Ocean Blvd., #1515
Long Beach, CA 90802
Phone: (562) 590-8599
Fax: (562) 684-4418
Website: www.epulppaper.com

ANZDL
3601 S. Harbor Blvd.
Long Beach, CA 92704
Phone: (562) 436-6193
Fax: (562) 436-4593
Website: www.anzdl.com

APL Sales
18200 Von Karman Ave., Ste. 7
90 Irvine, CA 92612

The left sidebar contains navigation links: Home, Documents (Wikipedia, Stakeholders, Modeling, Simulation, and Analysis, Shared Documents), Lists (Calendar, Tasks), Discussions (Regional Planning Wiki Design Discussion, Team Discussion), Sites, People and Groups, AIDC data example, Site Hierarchy, Connections, Libraries, Locations and Objects, Maps, Networks, and Optimization.



Example: wiki article

Regional Planning Team Site - ICTF

Home > Regional Planning Team Site

Welcome WIN-SERVER-2003\administrator

This Site: Regional Planning Te

Regional Planning Team Site

Home Site Actions

Regional Planning Team Site > Wikipedia > ICTF

ICTF

Source: [ICTF Briefing Guide](#)

History

The ICTF project was originally conceptualized by the Ports of Long Beach and Los Angeles. The original concept of the Ports was to involve all three railroads in a joint facility. The ATSF and the UP declined to participate in the Ports project believing that their downtown facilities had enough capacity to handle the ports projected growth. Uncertainties in the Panama Canal and the development of doublestack technologies are primarily responsible for the explosions in land-bridge volumes. The two ports and the UP formed a Joint Powers Authority to build and finance the construction of the ICTF. The JPA authorized a Bond issue to finance the construction of the ICTF. A requirement of the Bond issue is a gate charge for all containers entering or leaving the ICTF, currently \$30.00.

Physical Description

The ICTF is located in Long Beach adjacent to the intersections of the 405 and Long Beach freeways at 2401 East Sepulveda Boulevard. The Terminal Island freeway terminates at the front entrance to the ICTF. Alameda Boulevard is the other main access to the Ports. The ICTF is approximately four miles from the Ports of Los Angeles or Long Beach.

This facility has a single rail entrance at the North-end. The South-end was to have been the UP and ATSF access. As a result of the single access the two tracks on the outside are reserved for run-around and escape track. The budgeted expansion for ICIT allows for the conversion of these two tracks to working tracks. Currently there are six working tracks ranging in length from 12 to 17 DS cars in length. The two escape tracks will expand the number of working tracks to seven.

There are two primary items, which allow the ICTF to handle the large volumes of containers efficiently:

1. Storage of trains and equipment: Dolores Yard has 10 tracks roughly double in size to those within the ICTF. With the availability of Dolores Yard all of the working tracks within the ICTF can be used for production. If Dolores Yard was not available, the capacity of ICTF would be less than one half of its current capacity. Dolores Yard is used in combination with the ICTF to stage empty double-stack cars and other intermodal equipment and inbound or portions of outbound trains until they can be handled. Working tracks within a facility that have equipment stored or held on them cannot be used for production.
2. The computerization of the inventory: the ICTF's inventory is computerized. All of the assigned parking spaces within the ICTF are numbered and color-coded to allow them to be assigned to a container on a chassis. This inventory is kept accurate by assigning all entry into this facility. All of the hostlers within this facility also have on-board computer devices which allows the records to be updated by the yard hostlers anytime they move a container within the yard. All of the containers departing the gate of this facility are recorded and the inventory updated. The ICTF's inventory and activity reporting is conducted and maintained in OASIS computer system. OASIS offers real-time reporting of all yard activities. OASIS location finders are available onsite for truckers to obtain locations of containers in the yard.

Link to a diagram of the ICTF

View All Site Content

Documents

- Wikipedia
- Stakeholders
- Modeling, Simulation, and Analysis
- Shared Documents

Lists

- Calendar
- Tasks

Discussions

- Regional Planning Wiki Design Discussion
- Team Discussion

Sites

People and Groups

AIDC data example

Site Hierarchy

Connections

Libraries

Locations and Objects

Maps

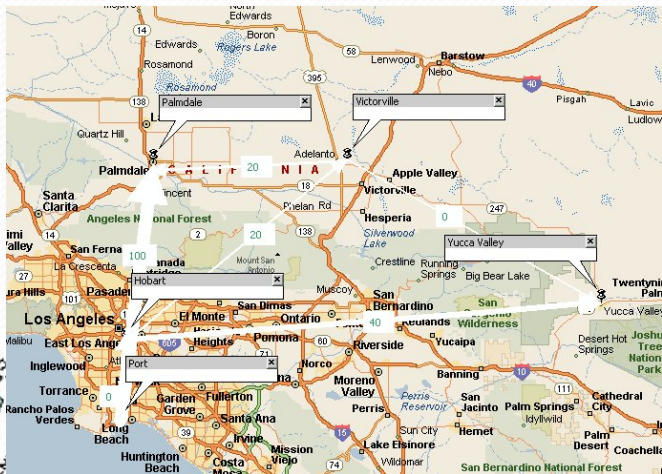
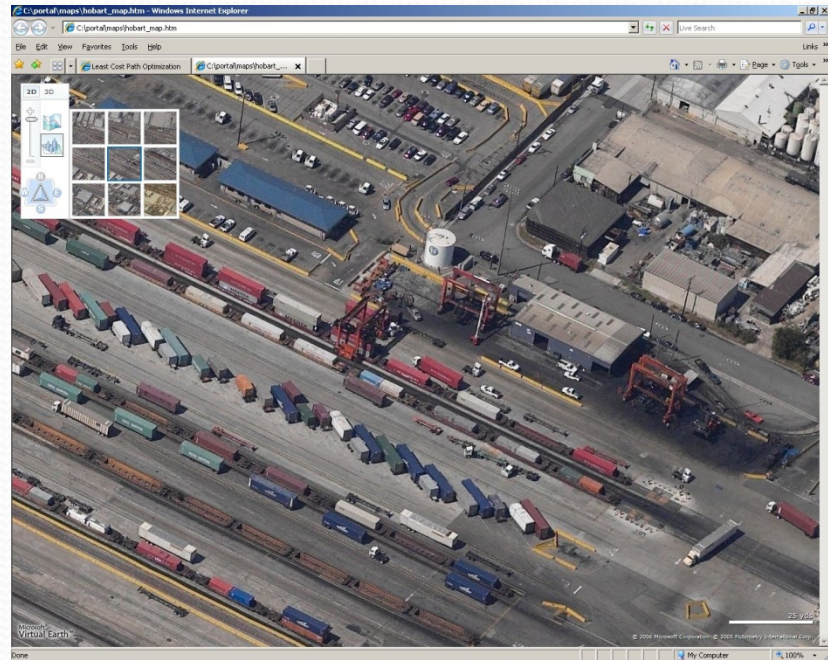
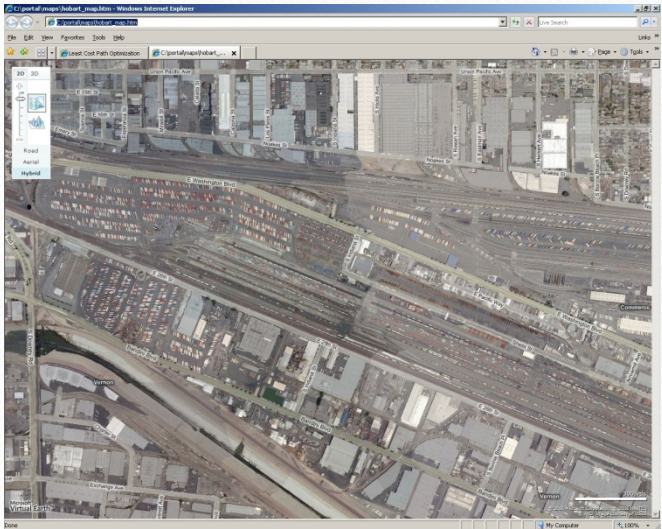
Networks

Optimization

Done Local intranet 100%



Geo-spatial visualization



Example: Least Cost Path Optimization

	A	B	C	D	E	F	G	H	I	J	K	L
	Name	Property name	Property value	Property name	Property value	Property name	Property value	Property name	Property value	Property name	Property value	
1	Ports	Node cost	0	Supply/Demand	160	Node capacity UB	200	Node Capacity LB	0	Geolocator	lat=118.238811, lon=23.756395, datum=WGS84	
2	Hobart	Node cost	0	Supply/Demand	0	Node capacity UB	200	Node Capacity LB	0	Geolocator	lat=118.205368, lon=24.013192, datum=WGS84	
3	Palmdale	Node cost	0	Supply/Demand	-120	Node capacity UB	200	Node Capacity LB	0	Geolocator	lat=118.107852, lon=34.5736831, datum=WGS84	
4	Yucca Valley	Node cost	0	Supply/Demand	-40	Node capacity UB	200	Node Capacity LB	0	Geolocator	lat=118.43382, lon=34.90971, datum=WGS84	
5	Victorville	Node cost	0	Supply/Demand	0	Node capacity UB	200	Node Capacity LB	0	Geolocator	lat=117.282957, lon=34.527672, datum=WGS84	

	C	D	E	F	G	H	I	J	K
	Start	End	Property name	Property value	Property name	Property value	Property name	Property value	
1									
2	Ports	Hobart	Cost	1	Capacity UB	150	Capacity LB	0	
3	Ports	Palmdale	Cost	9	Capacity UB	100	Capacity LB	0	
4	Hobart	Yucca Valley	Cost	8	Capacity UB	60	Capacity LB	0	
5	Hobart	Victorville	Cost	9	Capacity UB	100	Capacity LB	0	
6	Victorville	Palmdale	Cost	3	Capacity UB	100	Capacity LB	0	
7	Victorville	Yucca Valley	Cost	5	Capacity UB	60	Capacity LB	0	
8									
9									



	A	B	C
1	Property name	Property value	
2	Title	Least Cost Path Optimization Results	
3	Nodes file	c:\portal\optimization\input\Opt_Test_Nodes.xlsx	
4	Links file	c:\portal\optimization\input\Opt_Test_Links.xlsx	
5	Results file	c:\portal\optimization\output\LCP Test.xlsx	
6	LCP total flow	1520	
7	LCP flow per link	60,100,40,20,20,0	
8			



Least Cost Path Optimization - Windows Internet Explorer

http://localhost:2200/LeastCost/LeastCost.aspx

Regional Planning Team Site

Least Cost Path Optimization

This page executes the Least Cost Path Optimization Analysis functions of the Strategic Mobility 21 Program. Once you have created both a Locations and Objects File and a Connections File to be the basis for the analysis, the analysis can be performed by following the steps listed below.

Step I: Select input and output files

a. Browse to select the Locations and Objects File. If you are running from within the Regional Planning Web Portal, this file should be selected from the Locations and Objects Library.

Problem element	Select file	Upload File	Status
Locations and Objects File	<input type="button" value="Browse"/>	<input type="button" value="Upload"/>	L&O file 'Opt_Test_Nodes.xlsx' was uploaded.

b. Browse to select the Connections File. If you are running from within the Regional Planning Web Portal, this file should be selected from the Connections Library.

Problem element	Select file	Upload File	Status
Connections File	<input type="button" value="Browse"/>	<input type="button" value="Upload"/>	Connection file 'Opt_Test_Links.xlsx' was uploaded.

c. Enter a name for the output file. You can browse to see existing file names and copy the file name to the output file name box for modification. The file name must end in ".xlsx".

Problem element	Select existing file or enter new file name	Upload or Create File	Status
Output File	LCP Test.xlsx <input type="button" value="Browse"/>	<input type="button" value="Create"/>	New output file 'LCP Test.xlsx' was created.

Step II: Execute the Least Cost Path Optimization Analysis: Succeeded!

Step III: View the results (below and also in the output file named above):

Property name	Property value
Title	Least Cost Path Optimization Results
Nodes file	c:\portal\optimization\input\Opt_Test_Nodes.xlsx
Links file	c:\portal\optimization\input\Opt_Test_Links.xlsx
Results file	c:\portal\optimization\output\LCP Test.xlsx
LCP total flow	1520
LCP flow per link	60,100,40,20,20,0



The Military Ship and Rail Load Planning Web Portal

- Apply today's collaboration, planning, and algorithm technologies
- Selective process improvements
- Adapt legacy systems (SOA?)
- Fill gaps with existing technologies, new algorithms, and process revisions
- Support building a JPPSP in Victorville



Example deployment

Home - Example Deployment - Windows Internet Explorer

http://develop/Load_Planning/Example_1/default.aspx?PageView=Shared

File Edit View Favorites Tools Help

Home - Example Deployment

GSC Associates Development Site > Load Planning > Example Deployment

Welcome DEVELOP administrator

This Site: Example Deployment

Example Deployment

Home Site Actions

View All Site Content

Pictures

Documents

- Shared Documents
- Sisler Wiki
- Sisler Figures and Tables
- Rail cars
- Rail car tables and figures

Lists

- Calendar
- Tasks

Discussions

- Team Discussion

Sites

People and Groups

- Recycle Bin

This is the team site for the Example 1 deployment.

Description

This is the Team Site for the "Example 1" deployment. This deployment is a hypothetical case based on real data from a past deployment in the Pacific North West. In Example 1, a Stryker Brigade Combat Team is deployed by rail to the Port of Long Beach where it is loaded onto the USNS Sisler. The California United Terminal (CUT) is used for this deployment.

This site incorporates the Sisler Wiki that contains information about the characteristics of the USNS Sisler (T-AKR 311) taken from the Large, Medium Speed, Roll-On/Roll-Off Ships Users' Manual (MTMCTEA PAMPHLET 700-6).

Use the "Load Planning" link on the right to navigate to the web page that executes the planning algorithms that derive ship and rail load plans from an ICODES stow plan.

Calendar

There are currently no upcoming events. To add a new event, click "Add new event" below.

- Add new event

Links

- Load Planning
- Add new link

Local intranet 100%

Rail car wiki

Example Deployment - Home - Windows Internet Explorer

http://develop/Load_Planning/Example_1/Rail%20cars/Home.aspx

File Edit View Favorites Tools Help

Example Deployment - Home

GSC Associates Development Site > Load Planning > Example Deployment

Welcome DEVELOP administrator

This Site: Example Deployment

Example Deployment

Home

Example Deployment > Rail cars > Home

Home

Edit History Incoming Links

Welcome to the Rail Car wiki library!

You can get started and add content to this page by clicking **Edit** at the top of this page, or you can learn more about wiki libraries by clicking [How To Use This Wiki Library](#).

Extracted from Tiedown Handbook For Rail Movements (TEA PAM 55-19)

Section IX. Flatcar Types

A relatively few types of chain-equipped flatcars serve the bulk of the military's needs. Flatcar lengths fall into two main categories: 60 to 68 feet and 89 feet. The shorter cars are typically about 10 to 10-1/2 feet wide and the 89-foot cars are 9 to 9-1/2 feet wide. Most of the commercial flatcars are nominally 70-ton capacity cars, while the DOD-owned cars (DODX) are 100-ton cars for the DODX 41000- and 42000-series (figs 16 and 17) and 140-ton cars for the DODX 40000-series (fig 18). The weight each flatcar can actually carry, and which you must not exceed, is stenciled on the side as the load limit (LD LMT). Additional information is published in MIL-STD-1366 available at <http://assist2.daps.dla.mil/quicksearch/> or at <https://www.tea.army.mil/pubs/res/dep/ty/transinstruction/MIL-STD-1366D.pdf> starting on page 17.

Among the commercial flatcars, the majority are owned by TTX Company with the others being owned by the various railroads. The OTTX (fig 19), most ITTX (fig 20), and similar flatcars are equipped with 3/8-inch chains, which are suitable for the generally lighter military vehicles. The HTTX (fig 21), TTDX (fig 22), and some ITTX cars are equipped with 1/2-inch chains suitable for all military vehicles that will fit on each car type. These TTX cars will reach the end of their 50-year life and will be scrapped around 2015.




Figure 19. OTTX 60-foot flatcar.

B. FLATCAR SUPPLY

1. You will likely encounter both DODX and non-DODX flatcars.
2. DODX 40000-series flatcars (6-axle, 68') can carry two heavy tracked vehicles and DODX 41000-series flatcars (4-axle, 68') can carry one; these are the only flatcars authorized to carry heavy tracked vehicles. Their 68-foot length also makes them useful to carry tractor/trailer combinations such as the HET and the Patriot.
3. DODX 40000-, 41000-, and 42000-series (4-axle, 89') flatcars all have 1/2-inch chain tiedown assemblies for vehicles and container attachment points for 20-foot ISO containers. DODX 48000-series flatcars (4-axle, 89') have only container attachment points.

Done

Local intranet 100%

Example: Ship Load Planning

	A	B	C	D	E	F
1	Ship	Stow Area	Model Number	Description	Bumper Number	TCN
298	USNS SHUGHART v.2006074	2BDX	M1129E	MORTAR CARR/STRYKER	HHC93	AWH9STO\$0D00610XX
299	USNS SHUGHART v.2006074	2BDX	M1130	COMMAND VEH/STRYKER	HQ28	AWJHSTO\$0D00140XX
300	USNS SHUGHART v.2006074	2BDX	M1130	COMMAND VEH/STRYKER	HQ63	AWH9STO\$0D00180XX
301	USNS SHUGHART v.2006074	2BDX	M1131	FIRE SUPT	B71	AWH9QBO\$0D000710XX
302	USNS SHUGHART v.2006074	2BDX	M1133	MED EVAC VEH/STRYKER	HQ79	AWASMT0\$0D00110XX
303	USNS SHUGHART v.2006074	2BDX	XM1126	INF CARR VEH/STRYKER	NBN	AWH9SAD\$0D04240XX
304	USNS SHUGHART v.2006074	2BDX	XM1126	INF CARR VEH/STRYKER	B75 (2-1	AWH9SAD\$0D04300XX
305	USNS SHUGHART v.2006074	2BDX	XM1126	INF CARR VEH/STRYKER	NBN	AWH9SAD\$0D04320XX
306	USNS SHUGHART v.2006074	2BDX	XM1130	COMMAND VEH/STRYKER	HQ88 (BD	AWD8XAA\$0D04270XX
307	USNS SHUGHART v.2006074	2BDX	XM1132	ENG SQD VEH/STRYKER	EN 213	AWD77AA\$0D04250XX
308	USNS SHUGHART v.2006074	2BDX	XM1133	MED EVAC VEH/STRYKER	HQ73(1-1	AWH9QTO\$0D04280XX

	A	B	C
1	Property name	Property value	
2	Ship file	Sisler decks and holds.xlsx	
3	Terminal file	POLB CUT.xlsx	
4	Equipment file	Example 1 v1 equipment list.xlsx	
5	Rail cars file	Example 1 v1 rail.xlsx	
6	Hoist cargo delay		0
7	Upper decks delay		5
8			

	A	B	C	D	E	F	G
Reference Number	Deck Name	Hold Name	ICODES Stow Area	WP Load Area	WP Flow Path Order		
1							
2	45 G Deck		4 4GDX	G Deck Hold 4 Port	2		
3	45 G Deck		4 4GDX	G Deck Hold 4 Starboard	3		
4	44 Ramp G To F		3 3RGF	Ramp G To F Hold 3	7		
5	43 G Deck		3 3GDX	G Deck Hold 3 Port	1		
6	43 G Deck		3 3GDX	G Deck Hold 3 Starboard	4		
7	42 G Deck		2 2GDX	G Deck Hold 2 Port	6		
8	42 G Deck		2 2GDX	G Deck Hold 2 Starboard	5		
9	41 F Deck		4 4FDX	F Deck Hold 4 Port	9		
10	41 F Deck		4 4FDX	F Deck Hold 4 Starboard	11		
11	40 Ramp F To E		3 3RFE	Ramp F To E Hold 3	16		
12	39 F Deck		3 3FDX	F Deck Hold 3 Port	8		

Least Cost Path Optimization - Windows Internet Explorer

http://localhost:2285/LeastCost/LoadPlanning.aspx

File Edit View Favorites Tools Help

Least Cost Path Optimization

Load Planning Team Site

Load Planning

This page executes the Load Planning functions of the Strategic Mobility 21 Program. The only required input data is a Deployment File that contains links to all the other data needed to plan the rail and ship loading, including the Ship Stow Plan (from ICODES), the associated Ship Configuration File (created from TEA data), the Rail Transportation Plan (from TC-AIMSII), and the Terminal File. The Output file is automatically named based on the name of the Deployment File.

Step I: Select deployment

a. Browse to select the Deployment File. If you are running from within the Regional Planning Web Portal, this file should be selected from the Deployment Library.

Problem element	Select file	Upload File	Status
Deployment File	<input type="text"/> <input type="button" value="Browse..."/>	<input type="button" value="Upload"/>	L&O file 'Example 1 v1.xlsx' was uploaded.

Step II: Execute the Load Planning Function:

Step III: View the results (below and also in the output file):

The Load Planning function was successfully executed. Output file Example 1 v1 Output.xlsx was created

	C	D	E	F	G	H	I	J	K	L
1	Description	Quantity	Area sq.feet	POD	POE Symbol Name	UIC	UIC Noun	WP Load Area	WP Load order	
2	TRK UTIL HVY HMMWV	1	121 PNs	###	SMTX00001	FFHNV0		F Deck Hold 1 Starboard	10	
3	CHASSIS,TRAILER CARG	1	84 PNs	###	LGTR00039	FFHNV0		F Deck Hold 1 Port	12	
4	TRUCK UTILITY 4X4	1	112 PNs	###	SMTX00001	FFHNV0		F Deck Hold 3 Starboard	13	
5	TRUCK UTILITY 4X4	1	112 PNs	###	SMTX00001	FFHNV0		Ramp F To E Hold 3	16	
6	TRK UTIL HVY HMMWV	1	114 PNs	###	SMTX00001	FFHNV0		E Deck Hold 4 Port	18	
7	GEN SET GED TLR MTD	1	76 PNs	###	LGTR00038	FFHNV0		E Deck Hold 4 Starboard	20	
8	TRK UTIL HVY HMMWV	1	114 PNs	###	SMTX00001	FFHNV0		Ramp E To D Hold 3	25	
9	TRK UTIL CRG/TRP CAR	1	125 PNs	###	SMTX00001	FFHNV0		D Deck Hold 1 Starboard	31	
10	TRK UTIL CRG/TRP CAR	1	114 PNs	###	SMTX00001	FFHNV0		D Deck Hold 1 Port	32	
11	TRUCK CARGO TACTICAL	1	134 PNs	###	SMTX00008	W27P21	W27P	PEO G Deck Hold 4 Port	2	
12	TRUCK CARGO TACTICAL	1	134 PNs	###	SMTX00008	W27P21	W27P	PEO G Deck Hold 4 Starboard	3	
13	TRAILER CARGO 3/4-TO	1	76 PNs	###	SMTR00019	W27P21	W27P	PEO G Deck Hold 2 Port	6	
14	GENERATOR SET	1	76 PNs	###	LGTR00038	W27P21	W27P	PEO F Deck Hold 3 Port	8	



Future research

- Apply the Load Planning Web Portal to an upcoming deployment
- Add to datasets, wikis, and tools
- Apply the Regional Planning Web Portal to several specific regional issues
- Add rail operation planning to the Load Planning Web Portal
- Study wiki use by communities of interest in “solving” wicked problems

