A REGRESSION MODEL FOR VESSEL TURNAROUND TIME

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ABSTRACT

Turnaround time in port industry portrays capability and ability of container terminal in providing services. This study is motivated by the rapid development in port container terminal, in providing efficient and effective services and high port productivity, with the aim to achieve optimum port performance. Research arises from the issue between port throughputs (i.e. Teus- Twenty Footer Equivalent Unit) and port facilities (e.g. quay crane, prime movers etc), as currently it is not possible to determine significant factor(s) that influence port performance, in terms of turnaround time. For this purpose, the research proposes a regression model that relates these variables, i.e. turnaround time and port facilities. Two ports in Port Klang – Westport and Northport – are used as the subjects from which actual vessel call data collected between August 1 and August 31, 2005 are used. The results show that vessel turnaround time is highly correlated with crane allocation as well as the number of containers loaded and discharged. The benefits of such model include giving port operators opportunity to determine optimum crane allocation to achieve the desired turnaround time given the quantity of containers to be processed.

Keywords: Vessel turnaround time, port operations, resource allocation, multiple linear regression

1.0 Introduction

The globalisations of trade and subsequent breakdown in trade barriers have spurred tremendous growth in marine transportation. Thus, the stiff competitions among port operators have increased in the sense to attract port users. Therefore, port operators have to consider lower turnaround time for vessel in order to benchmark good productivity and performance for their terminals. As far as this paper is concerned, Port Klang has been chosen as field study where, Westport and Northport are subjected for data collection. These ports have been given the option to develop the remaining port facilities planned under the Port Master Plan 1990-2010.

Evidently, Port Klang's aim is to be hub centre for national and regional container traffic (Klang Port Authority, 2005). With that, this paper is to relate from the issue between port throughputs (Teus –Twenty Foot Equivalent Unit) and port facilities (e.g. quay crane, trucks, yard cranes, etc.), as it is not possible to determine significant factor(s) that influence port performance, in terms of turnaround time. The principles of these objectives are to understand how turnaround time is measured, to identify port facility that determines turnaround times and to develop a regression model that relates turnaround time with port facility. The methodology of this paper is derived from multiple linear regression as it is entails the use of the method of least squares for estimating among other statistical relationships between variable.

Therefore, turnaround time (TT) can be summarised as below:

$$TT = f\left\{Port\ Facility\right\} \tag{1.1}$$

Uniquely, this paper is able to help port container terminal to verify the problems in an identified area and to come out with better solutions in providing services and improving activities within the port to ensure optimum productivity and efficiency that can be achieved. With that, the outcome of this research is to determine which independent variables are the most significant to determine turnaround time for vessel.

The components of this paper start with introduction of issue and the objectives. The next stage is the discussion of significant literatures from various papers. Then it is followed with methodology that will be used for analysis. The last part are findings, recommendations and conclusion.

2.0 Port Performance and Turnaround Time

The turnaround time issue, which has been discussed and argued by many scholars since the emergence of containerisation for the last three decades have evolved a lot of development. According to UNCTAD, (1976) under operational indicator, it states clearly turnaround time is crucial to be considered, where it portrays port capability and ability to provide tremendous services with high productivity and performance to port user. Ng, (2004) argues that the most important objective for a port container terminal is to increase its throughput or in other word is to decrease the turnaround times of vessels. As a result, the turnaround time of a vessel is depending on the effectiveness of allocating and scheduling key resources such as, quay cranes, yard cranes, berths and trucks. Back then, Nagorski, (1972) already foresees this scenario when he discusses that a careful planning is necessary for obtaining satisfactory results. As well as Nor Ghani, (1996) also stresses out on turnaround time when he studies the relationship between queuing theory and congested cost. Consequently, the issue of turnaround time for vessel is related with berthing cost for shippers and increment voyage for vessel itself. Preston and Kozan, (2001) also urge the vital of turnaround time for vessel, as it becomes its objective to minimise the time vessels spent at berth. Port users are looking into berthing side as it is actually can determine the whole aspects such as cost, voyage, marketing, planning and scheduling. The pivotal key here is turnaround time for vessel, because it is able to solve a lot of things for shipping industry. Consequently, taken into consideration supply chain process, high turnaround time means the process from raw material to user is able to reduce, therefore economic of scale is able to be achieved.

Marlow and Paixao, (2003) argue that most of researches conducted in port container performance are based on quantitative measures, as it is easier in assessing port performance. Port container terminal is a service-oriented, therefore, efficiency is very crucial in determining moves per hour for loading and discharging container from and onto vessel. Whereby, productivity lays on as measurement for container moves per hour for every vessel. There have been some researchers who already looked into port performance and efficiency to show the critical aspect in container terminal (Clark et al., 2004; Safaradis, 2002; Sanchaz et al., 2002; Estache et al., 2002; Bardhan et al., 1998; Tongzon, 1994, 1999, 2001; and Talley, 1994). Since the current scenario of world trade goes to cellular vessels, thus the demand for transportation good via sea increases tremendously. With that, more and more port container terminals are expanding their terminals in order to cater the available demand. Hartmann, (2004) argues that container terminals are facing challenges of reaching turnaround time with more and larger vessel in the shortest possible time. As a result, in order to obtain operational efficiency objective, there are three aspects between planning and control level which can be segregated into strategic level, tactical level and operational level (Vis and Koster, 2003). This means port container terminals need to enhance their planning and operation capability by deploying innovative equipments and state-of-the-art technology in order to optimise container terminal logistic process. In order to optimise port container terminal resources, it is really vital to ensure that port container terminal operational flow is able to operate smoothly.

Singapore, Gordan et al.,(2005) mention, even a small nation is able to surpass its natural constraint by evidently successfully applying information technology in critical areas with the reason to increase the island's capacity to handle huge throughput in port container terminal. Apart from that, Singapore is also providing supportive government policies to shipping line, ample investment from government and private, as well as operations, location, and deep water draft for vessel, and simultaneously sustains Singapore's port among port users. Marlow and Paixao, (2003) and Tongzon, (1995) make use of port performance indicator in order to focus and getting distinction between port efficiency and effectiveness as well as in measuring port performance. UNCTAD, (1976) has become the benchmark as an indicator when measuring port performance. Surprisingly, it has been used until now even though UNCTAD, (1976) only focuses on financial and operational indicators and even for conventional terminal.

Back then, Oram and Baker, (1971) state that turnaround time is one of the factors that should be included when measuring port performance; the other factors are material handling or labour productivity and berth occupancy.

In late 1960's, 1970's and early 1980's as derived from Journal of Transport Economic and Policy was keen on published papers regarding turnaround time issue. Even though the issues closely related with economic and policy, the contribution towards port industry had impacted the industry. As well as the study more on conventional port, thus back then, the evolution of containerisation and cellular vessel started with dynamic progress. Whereas in 2000's most of research in port container terminal are narrowing the scope by focusing on terminal equipments such as yard crane and truck (Ng, 2003; Ng et al., 2005; Zhang, 2002; Kim et al., 2001), quay crane (Kim et al., 2004, Kozan, 2001) and rubber tyre gantry crane (Zhang et al., 2002). They focus on these aspects to ensure that container terminal operators are able to maximise these kinds of equipments.

Table 2.1 Performance Indicator Suggested by UNCTAD[1]

Financial Indicators	Tonnage Worked
	Berth occupancy revenue per ton of cargo
	Cargo handling revenue per ton of cargo
	Labour expenditure
	Capital equipment expenditure per ton cargo
	Contribution per ton cargo
	Total contribution
Operational Indicators	Arrival late
	Waiting Time
	Service Time
	Turnaround Time
	Tonnage per ship
	Fraction of time berthed ships worked
	Number of gangs employed per ship per shift
	Ton per ship hour at berth
	Tons per gang hours
	Fraction of time gang idle

Source: UNCTAD (1976)

UNCTAD[1] United Nations Conference on Trade and Development

In port container industry, Tongzon, (1994) describes that port performance is measured in terms of the number containers moved through a port, known as throughput, on the assumption that the ports are throughput maximisers. In addition, Tongzon, (1994) also brings out an alternative port performance indicator in simpler way than UNCTAD, (1976), when it concerns on location, frequency of vessel calls, port charges, economic activity and terminal efficiency, hence Tongzon, (1994) conceptualises it into economic, location, and operational. Talley, (1994) delivers his port performance indicators, and narrows it only into economic perspective.

As far as port container industry is concerned, port performance measure is critically vital to everyone who involves in shipping industry, however it is very surprising that there are almost no standard methods that are accepted as applicable to every port for the measurement for its performance. Hence, a lot of argument can be made since the methods are different, and actually it will distort the development of port industry itself (Culllinare et al. 2002). Talley, (1994) attempts to build a single performance indicator in financial aspect as the shadow price of variable port throughput per profit dollar to evaluate performance of a port and this overcomes the drawback of multiple indicators. Evidently, it can be concluded that even a single performance indicator (financial), is merely impossible to be standardised as the methods applied varies such as allocating capital cost, different taxation systems, depreciation of assets, different forms of ‘financial assistance’, and cargo handling costs as it mutually based on negotiation with client.

Productivity is a summary measure of a quantity and quality work of performance with resource utilisation considered. According to Summath, (1984, p.4) clarifies the meaning of productivity as a concerned with the efficient utilisation of resources (input) in producing goods and or services (output). Whereas, in shipping industry, Kim et al.,

(2003) describe that port container terminal productivity can be measured in two types of operations; first, is the vessel operation, which involves discharge and loading of container from and onto vessel. The other one is receiving and delivering operations, where containers transfer to and from outside trucks. In addition, as far as financial is concerned, productivity in port container operation is the key determinant for the cost of providing container stevedoring services.

Meyrick and associates and Tasman Asia Pacific, (1998) report there are two partial productivity measures that have been used in port productivity studies. First is annually lifts per employee (labour productivity), and it is defined as the number of container movements (container lifts) per terminal employee. The other is net crane rate (capital productivity) and it is defined as the number of container movements (container lifts) per net crane hour. Deliberately, De Monie, (1987) reports the measurement of port productivity is greatly impeded with some factors: the sheer number of parameters involved; lack of up-to-date, factual and reliable data, collected in an accepted manner and available for dissemination; absence of generally agreed and acceptable definitions; profound influence of local factors on the data obtained and divergent interpretation given by various interests to identical results. Ironically, these factors are slightly better with the emerging of information technology. As the advent of information technology synchronises the process and procedure in various industries, therefore productivity as well continuously improved. Even though cost factor for technological advent higher than others, in long terms it merely surpasses cost factor.

Oram and Baker, (1971) define vessel turnaround time as the process needed for loading, discharging and servicing a vessel from berthing until vessel's departure. This period starts from actual arrival of a vessel at berth to its actual departure from the berth. The way of measuring vessel turnaround time has been done by Amoyaw, (1999) and Imikata, (1978).

Since UNCTAD, (1976) rules out the indicators for port performance as a guidance for everybody. Then, Oram and Baker, (1971) express the important and significance of turnaround time studied rather than other aspect when a statement has be done in the sense of its implication where "*no single cause more directly affects the cost of living of a maritime country than the speed with which ships are turnaround in her ports*". Clark et al. (2004) elaborate further that port efficiency is directly affected turnaround time for vessel in wharf. And it is varies widely from country to country and region to region. As being proven, Singapore and Hong Kong are the most efficient ports in the world, whereas, inefficient ports are located in developing and third world countries such as Ethiopia, Nigeria, Malawi for Africa continent, or in South America such as Colombia, Venezuela and Ecuador. Since port efficiency is highly correlated with handling cost, therefore, lower turnaround time for vessel means that particular container terminals are having higher handling costs. And the length of time spent by vessels in port represents a loss of revenue from economic point of view (Takel, 1974). Evidently proven, that turnaround time directly does impact port container terminal performance either from economic or operational point view.

3.0 Regression Model for Vessel Turnaround Time

In port industry, parametric method is widely used to analyse the finding (Estache et al., 2002; Cullinane et al., 2002; Shayan et al., 2002; Kim et al., 2001; and Amoyaw, 1999). Cullinane et al., (2002) add further that this approach has strong policy orientation, especially in assessing alternative industrial organisations and in evaluating the efficiency of government and other public agencies.

From Eq 1.1 port facilities can be expressed as:

$$TT = \alpha + \beta_1 QC + \beta_2 RT + \beta_3 S + \beta_4 R + \beta_5 H + \beta_6 E + \beta_7 T + \beta_8 M + \beta_9 F + \varepsilon \qquad (3.1)$$

Where:

α	= constant
$\beta, \beta_2 .....\beta_k$	= coefficients
QC	= Quay Crane
RT	= Rubber Tyre Gantry Crane
S	= Straddle Carrier
R	= Reach Stacker
H	= High Stacker
E	= Empty Stacker
T	= Trailer
M	= Mobile Harbour Crane
F	= Front-end Loader
ε	= error

There is one rule must be followed, where each independent variable cannot be significantly correlated with other independent variables, and it can be tested by using Variance Inflation Factor (VIF). Therefore, the model should be refined after been tested. Vis and Koster. (2003) argue that quay crane either in automated or a manned container terminal is the most influential; then again Kim et al. (2004) also argue that the variable (quay crane) is the most vital in determining turnaround time for vessel berth. After taking into consideration both justifications, therefore, the regression model is functionally expressed as below:

$$SvsHrs = f(CrnAllc, Load, Disch,) \qquad (3.2)$$

Where:

$SvsHrs$	= Service Hours
$CrnAll$	= Number of Quay Crane
$Load$	= Loading Containers
$Disch$	= Discharge Containers

Therefore, the refined regression model is:

$$SvsHrs_t = \alpha + \beta_1 CrnAll_t + \beta_2 Load_t + \beta_3 Disch_t + \varepsilon \qquad (3.3)$$

Where:

$SvsHrs_t$ = Service Hours

α = Constant

$\beta_1 .....\beta_3$ = Parameters or coefficients

$CrnAll_t$ = Crane Allocation (Unit)

$Load_t$ = Loading Containers (Unit Teu)

$Disch_t$ = Discharge Containers (Unit Teu)

ε = Error

t = Month, t = 1, 2… T

In preparing the analysis, the sources of data are gathered from operational department of Westport and Northport. Then, the raw data are extracted in order to suit with the model, and from that, only data on crane allocation, loading and discharging containers are selected.

This study is using quantitative data, and being a parametric method in data analysis, it is important to know the coefficient of correlation, where $-1 \leq r \leq 1$, determines the degree of relationship between the variables. The correlation of coefficient is either positive or negative. By that, Variance Inflation Factor (VIF) takes place as a tool to test whether there is any significant relationship among the independent variables themselves. Severe multicollinearity problem exists if VIF > 4.

Next is testing hypothesis can be done in order to know either the null (H_0) or the alternative (H_1) hypothesis, through regression coefficient where the null (H_0) hypothesis is accepted when the coefficient of β_1 is not significant. Whereby, the alternative hypothesis (H_1) is accepted when the sample data provides ample evidence for the coefficient to be significant. The hypothesis test is conducted at 95% confidence level, by giving α, the significance level, of 5%. This model is developed and analysed by using Statistical Packages for Social Science or SPSS as it is well known especially in social science research.

4. Correlation and Regression Analysis of Vessel Turnaround Time

Bryan, (1974) mentions that while conducting analysis, two criteria are considered in doing estimation of a model in order to develop a model, which are theoretical relevance and data availability. As mentioned, after this model has been refined, the dependent and independent variables have changed accordingly. However, it will not influence the research as a whole. Apparently, service hour has been decided a model to be predicted (dependent variable) and quay crane is being main element for material handling, therefore, component for quay crane are crane allocation, loading and discharge.

The data from Westport and Northport are based on daily vessel call and subjected from vessel berth until vessel departure from container terminal wharves whereas the time frame is from August 1, 2005 to August 31, 2005.

Table 4.1 (Refer Appendix) depicts the results of Bivariate correlation analysis for Northport Container Terminal 1 and 2 and Westport Container Terminal. From and examination of the correlation, it is clear that there are various interpretations for correlation between dependent and independent variables. The most correlates container terminal goes to Northport Container Terminal 1, whereas for moderate goes to Westport

Container Terminal. The weakest goes to Northport Container Terminal 2. This test is to show which container terminal is having the strongest correlation between dependent and independent variables. With this result, therefore port operator is able to fully utilise the ratio between vessel and material handling.

The multicollinearity test is to ascertain if there is strong intercorrelation between independent variables, when there is intercorrelation between independent variables means that particular variables must be removed from the model. Table 4.2 (Refer Appendix) depicts the results for multicollinearity for Northport Container Terminal 1 and 2 and Westport Container Terminal. Since the Variance Inflation Factor (VIF) for each terminal is less than 4, it means each terminal does not suffer from multicollinearity. Therefore, from the results of testing of hypothesis it is proven that all independent variables are accepted for subsequent regression analysis.

Significance test of regression is a test for hypothesis, when a statement about a population parameter is needed. The statement must be checked based on data and probability calculation as derived from the statement in order to know the reasonable result. Based on data from Table 4.3, the significance value (*P*) is 0.000, and it is conducted at 95% confidence level by giving α**,** the significance level of 5%. The following describe the tests for (1) β_1, the coefficient for crane allocation, (2) β_2, the coefficient for loading, and (3), β_3 the coefficient for discharging. From that $H_0 : \beta_{1,2,3} = 0$ and $H_1 : \beta_{1,2,3} \neq 0$, by giving $\alpha = 0.005$ whereas $P = 0.000$ (Sig.value from Table 4.3), therefore, the decision for all terminals are reject H_0, when $P < \alpha$ and accept H_1. Overall, the results from testing of hypothesis for Northport Container Terminal 1 and 2 and Westport Container Terminal show that the alternative hypotheses (H_1) are accepted for the independent variables. This is because $P < \alpha$**,** as proven with 5% level of significance. With this reason, it shows that the coefficient of β_1, β_2, and β_3 are statistically significant based on evidence from the data. As a result the null hypothesis (H_0) is rejected.

Apart from that, Table 4.3 (Refer Appendix) is also describing the result for regression model for vessel turnaround time for Northport Container Terminal 1 and 2 also Westport Container Terminal. The statistical analysis shows that, at 5% significance level, the variables are statistically significant. This means that all the independent variables for each container terminals are correlated with the independent variable – Service Hour. The final regression model can be seen from the Table 4.4 (Refer Appendix), where the regression model results for Northport Container Terminal 1 and 2 and also Westport Container Terminal.

4.0 Conclusions and Recommendations

The port performance, as discussed is the lifeblood of ports, thus deserves maximum attention from port operators. Since it is the backbone of ports, the port must be efficient in order to achieve optimum result. Port performance, however, is not focusing only on equipments or facilities, but other aspects as well. Hence, by covering all aspects, the ability and capability of the port to produce high level of service can be established. The pivotal finding of turnaround time measurement is based on turnaround time concept itself. Based on literature reviewed it is concretely accepted that the measurement of turnaround time must be applied while operational process happens.

Apparently, research finding has come out with understanding of turnaround time by selecting port facilities accordingly. Technically, in this research it is not significant to select variables according to the facilities provided as the method applied is not reliable. Therefore, the model has to be refined according to the equipment selection in the sense of applicability of regression itself. Decidedly, as extracted from literature and results of finding, it therefore is able to deliberate that quay crane itself plays pivotal role as port performance enhancer. Delicately, by understanding turnaround time itself, simultaneously researcher is able to foresight on how terminal operators are able to produce high level of port services towards optimum performance.

Table 4.2 and Table 4.5 (Refer appendices) show all independent variables are accepted and all container terminals accept alternative hypothesis $\left(H_1\right)$, from the P values are less than α (P< α). By accepting the $\left(H_1\right)$ means that, the alternative hypothesis is able to provide ample statistical evidence that null hypothesis (H_0) is false.

From the finding, it is proven that the research model has been accepted after it has gone through model testing.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon \qquad (5.1)$$

i. Northport Container Terminal 1

Service Hour = 7.749 – 3.825 (CrnAll) + 0.019 (Load) + 0.020 (Disch).

ii. Northport Container Terminal 2

Service Hour = 18.820 – 12.524 (CrnAll) + 0.036 (Load) + 0.029 (Disch).

iii. Westport Container Terminal

Service Hour = 4.512 – 1.271 (CrnAll) + 0.014 (Load) + 0.011 (Disch).

While completing this research, there are some elements that have been noticed which can be explored for future research. First, this method is unable to compare the best port container terminals due to regression model itself is unable to produce comparative result. Mohamed Abdel Salam, (2005) highlights that data analysis is one of the methods besides queuing theory and simulation, however, with the drawback; it is advisable for others to explore alternative method which is able to produce comparative result. Since it is realised that by having one major determinant such as quay crane, the result is slightly inaccurate, therefore by having more than one determinant, the result should be better.

In studying port performance based on UNCTAD, 1976 there are two major indicators which are financial and operational. In conjunction with Malaysia climate, there are plenty of issues which are able to be conducted as a research since there are not many researches related to port industry if compared with the closer neighbour Singapore.

Since the introduction of containerisation back in 1970's, the evolution of containerisation has moved so dynamic. Back then, plenty of studies related to cellular vessels have been done, for the sake of higher port performance. UNCTAD, 1976 as been mentioned, came out with port performance indicator as a guide line for all either conventional, or container terminal. The revolution in port industry, to be mentioned contributes huge impacts especially for economic reason. However, in order to get and gain benefit from economic reason, it must have a good terminal, with efficient in service and high productivity. In order to cater the demand from port users around the world, most of port operators including Malaysia have spent huge money on infrastructure, information and communication technology, multiple skills manpower, and equipments. The reason is to have higher turnaround time for vessel at berth.

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Appendices

Table 4.1: Results of Bivariate Correlation Analysis for Northport Container Terminal 1 and 2 and Westport Container Terminal

		SvsHrs			CrnAll			Load			Disch		
Pearson Correlation		**NCT1**	**NCT2**	**WPT**	**NCT1**	**NCT2**	**WPT**	**NCT1**	**NCT2**	**WPT**	**NCT1**	**NCT2**	**WPT**
	SvsHrs	1.000	1.000	1.000	.577	-.101	.530	.800	.377	.745	.814	.323	.695
	CrnAll	.577	-.101	.530	1.000	1.000	1.000	.768	.601	.649	.787	.657	.717
	Load	.800	.377	.745	.768	.601	.649	1.000	1.000	1.000	.750	.514	.581
	Disch	.814	.323	.695	.787	.657	.717	.750	.514	.581	1.000	1.000	1.000

NCT1 – Northport Container Terminal 1
NCT2 – Northport Container Terminal 2
WPT - Westport Container Terminal

Table 4.2: Results of Testing of Hypothesis for Northport Container Terminal 1 and Westport Container Terminal

Model		**Sig.**	**Collinearity Statistics**					
			Tolerance			**VIF**		
			NCT1	**NCT2**	**WPT**	**NCT1**	**NCT2**	**WPT**
1	**(Constant)**	.000						
	CrnAll	.000	.309	.474	.404	3.236	2.109	2.474
	Load	.000	.354	.614	.552	2.821	1.630	1.812
	Disch	.000	.329	.547	.462	3.037	1.829	2.163

NCT1 – Northport Container Terminal 1
NCT2 – Northport Container Terminal 2
WPT - Westport Container Terminal
VIF - Variance Inflation Factor

Table 4.3: Results for Regression Model for Vessel Turnaround Time for Northport Container Terminal 1 and 2 and Westport Container Terminal

Model		Unstandardised Coefficients						Standardised Coefficients			t			Sig.
		B			Std.Error			Beta						
		NCT1	**NCT2**	**WPT**	**NCT1**	**NCT2**	**WPT**	**NCT1**	**NCT2**	**WPT**	**NCT1**	**NCT2**	**WPT**	
1	**(Constant)**	7.749	18.820	4.512	.470	1.187	.370				16.493	15.861	12.203	.000
	CrnAll	-3.825	-12.524	-1.271	.428	1.113	.265	-.454	-.820	-.220	-8.937	-11.250	-4.793	.000
	Load	.019	.036	.014	.001	.004	.001	.619	.581	.592	13.058	9.065	15.086	.000
	Disch	.020	.029	.011	.001	.003	.001	.706	.563	.509	14.369	8.301	11.865	.000
a Dependent Variable: SvsHrs														

NCT1 – Northport Container Terminal 1
NCT2 – Northport Container Terminal 2
WPT - Westport Container Terminal

Table 4.4: Final Regression Model for Northport Container Terminal 1 and 2 and Westport Container Terminal

Container Terminal	Regression Model	R^2
Northport Terminal 1	$SvsHrs = 7.749 - 3.825(CrnAll) + 0.019(Load) + 0.020(Disch)$	0.807
Northport Terminal 2	$SvsHrs = 18.820 - 12.524(CrnAll) + 0.036(Load) + 0.029(Disch)$	0.484
Westport Terminal	$SvsHrs = 4.512 - 1.271(CrnAll) + 0.014(Load) + 0.011(Disch)$	0.679