



**LUND UNIVERSITY**  
School of Economics and Management

Theoretical Reflections for Master of Entrepreneurship

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**Entrepreneurial theories in every day practice.**  
**- A case study of Trafvid.**

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## ABSTRACT

This thesis explores entrepreneurial theories in every day practice using the case study of Trafvid which is an entrepreneurial start-up company. Some of the theories that have been covered include the effectuation process and the role of legitimacy, customer reference and trust on start-up ventures. This thesis also covers some first mover advantages. This paper is an Autoethnography as the author will be exploring his experiences in starting up Trafvid leveraging the covered entrepreneurial theories and drawing both relevance and personal opinions whilst making a critical analysis about these theories in practice based solely on experiences with Trafvid.

## ACKNOWLEDGEMENT

I would like to take this opportunity to graciously extend my sincere gratitude to those who assisted us in one way or another in writing this thesis. Special mention also goes out to Tomas Karlsson for his coordination and endearing and insightful tutelage.

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TITLE	Entrepreneurial theories in every day practice – A case study of Trafvid
SEMINAR DATE	30 May 2011
COURSE	Theoretical Reflections for Master of Entrepreneurship
AUTHOR	Jeremiah Stephen Dorai
KEY WORDS	Entrepreneur, Start-up, Effectuation, Legitimacy, Customer Reference, Trust, and First- mover Advantages
PURPOSE	To share personal reflections and thoughts about starting up a new venture in Trafvid and how it relates to entrepreneurial theories the author finds most prevalent
METHODOLOGY	An Autoethnography
THEORETICAL VIEWS	This paper looks at some of the related and most prevalent entrepreneurial theories in the case of Trafvid
CONCLUSIONS	A brief glimpse into the entrepreneurial world and how certain theories or entrepreneurial applications may or may not be translated into reality or the way it was expected as mentioned in books or theoretical literature. Entrepreneurship is very much a hands-on experience and many a times it depends on circumstances and even luck. However being armed with entrepreneurial literature and theory gives one the tools needed to be better prepared for uncertainties and obstacles that every entrepreneur is bound to face.

## 1.0 Introduction

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*This first chapter provides a background on Trafvid and details the purpose of this theoretical reflections paper. The chapter ends with a description of the audience and a thesis outline.*

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### 1.1 Background

As part of the Business and Economics faculty at Lund University and as part of the Master of Entrepreneurship course, I am part of an initiative to help commercialize or bring to market one of the many research ideas and innovations within Lund University. I have teamed up with two researchers from the Faculty of Engineering, LTH. The new venture or start-up company that I am currently involved in at this time of writing is called Trafvid which stands for Traffic Video Analysis and we provide Intelligent Traffic Video Analysis with the use of software borne from 8 years of research. Trafvid provides a complete set of services related to the use of video in traffic studies, from experiment planning and camera installation to intelligent automated processing and analysis of the results.

Trafvid's core competence is to provide technical services using a special algorithm and state of the art software in analyzing the collection of detailed traffic data by utilizing automated video recordings and video analysis. What makes Trafvid's solution unique is that Trafvid can detect and track vehicles, cyclists and pedestrians and measure their positioning, speed and acceleration with high accuracy. Our customers would be road and infrastructure planning, civil engineering companies, university traffic engineering faculties and municipality traffic planning departments.

## 1.2 Purpose

The aim of this theoretical reflection is to share my personal reflections and thoughts with regards to starting up a new venture in Trafvid and how it relates to theories that I find most prevalent with regards to my new venture experience.

## 1.3 Audience

This study will be engaging for anyone with entrepreneurial aspirations of all types as well as researchers within the field of entrepreneurship.

## 1.4 Thesis Outline

The remainder of the thesis is divided into four chapters:

**Chapter 2:** This chapter presents the literature review and theoretical framework.

**Chapter 3:** This chapter details the methodological approach to this paper.

**Chapter 4:** This chapter details the theoretical analysis which includes my personal take away, reflections and critical analysis of past theories based on experiences with Trafvid.

**Chapter 5:** This last chapter presents concluding remarks.

## 2.0 Theoretical Background

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*This chapter presents the literature review and theoretical framework. The literature chosen was based on what I perceived as relevant and crucial to my experiences with Trafvid.*

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### 2.1 Effectuation

It has been debated and even contested to an extent but one can broadly acknowledge that the search for a distinctive theory of entrepreneurship (Shane and Venkataraman, 2000; Phan, 2004) is still inconclusive. While much study in the area of entrepreneurship seems focused on “discovering” and exploiting existing opportunities, Sarasvathy (2001(a)) offers the alternative view that opportunities come to be when they are “co-created” by the entrepreneur together with committed stakeholders and in doing so setting up the “found versus made” debate. Effectuation is a set of decision-making principles expert (defined according to predetermined criteria by Sarasvathy) entrepreneurs are observed to employ in situations of uncertainty. The alternative to effectuation is causality, which describes decision-making heuristics rooted in prediction. These are two contrasting logics where causation states that “if I can predict the future, I can control it” while effectuation states that “if I can control the future, I do not need to predict it” (Sarasvathy 2001(a)). Causation thus is about planning for the future in a process that takes a particular effect as given and instead focus on selecting between the means to create that effect while in effectuation planning is thrown out of the window where a set of means are given and which each mean results in their own respective effects. Effectuation provides heuristics specifically intended for uncertainty or under circumstances where no prediction can be easily made which so happened to be an environment in which many entrepreneurs operate (Alvarez and Barney, 2005; Sarasvathy, 2001b).

## 2.2 Legitimacy

In the case of new ventures and start-ups, legitimacy cannot be stressed upon enough as it is of unparalleled importance in its role in the creation, survival and growth of new small and upcoming firms. According to Zimmerman et al. (2002), legitimacy is a resource for a new venture – one that is at least important if not more than other resources like capital, technology, personnel, customer goodwill and networks. Suchman (1995) defines legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions".

According to Zimmerman et al. (2002), legitimacy is a social judgment of acceptance, appropriateness, and desirability, enabling organizations to access other resources needed to survive and grow and this is especially a critical factor when it comes to new firms where not having some sort of legitimacy could break the company. The article also mentions that legitimacy provides a means to overcome the "liability of newness" that contributes to the high percentage of new venture failure. Legitimacy can help motivate the investor because it represents a form of signal that the organization is properly constituted, highlighting that the company is trustworthy and committed to the proper codes of conduct of society. In fact legitimacy is a resource important for acquiring other resources, such as top managers, quality employees, financial resources, technology, and government support which are all crucial for new venture growth (Zimmerman et al. 2002).

A new venture can enhance its legitimacy by taking strategic actions and this is important since a lack of legitimacy is found in newness. One such fundamental legitimacy "tool" that new ventures can exploit is the business plan. According to Karlsson and Honig (2009), the business plan appeared to be largely a symbolic tool - for conforming to institutional pressures, rather than a functional utilitarian tool, and secondarily a marketing activity. The term 'loose coupling' was mentioned where business plans are used symbolically to gain legitimacy amongst external stakeholders irrespective of the actual implementation of the plan thus 'loosely coupling' their plans with the actual operations.



### **2.3 Customer Reference and the role of trust**

Ruokolainen (2008) tells us that “the next potential customer may appreciate the credibility gained from the first customer reference more than the innovativeness or low price of the new product. The importance of the first customer reference is undeniable and that the first customer reference is essential in attaining the necessary credibility to convey trustworthy market messages.” Ruokolainen(2008) quotes Birley(1995) and Eisenhardt and Schoonhoven (1996) in saying that startup companies can use the existing contacts of the owners to find customers. Thus just like legitimacy, customer references and recommendations/testimonials can play a big part in ensuring that a new start-up moves forwards with momentum and shift towards getting more customers and in the longer run helping to attain competitive advantages. This can be seen as an invaluable resource.

A key role in building up customer reference is trust as is the case in all relationship building and as mentioned by Doney et al (1998), trust is a valuable contributor to many forms of exchange. Trust is a key factor and without it the customer reference cannot be attained. According to Doney et al(1998), although trust may form in a variety of ways, whether and how trust is established depends upon the societal norms and values that guide people's behavior and beliefs that they use to decide whether and whom to trust. In other words, they may be heavily dependent upon a society's culture.

### **2.4 First-Mover Advantages**

Marvin, B. L. and B. M. David (1998) try to link First Mover Advantage (FMA) research to Resource Based View (RVB) research and make a supposition that the empirical research within FMA helps to resolve the deficit for RVB. First movers (FMs) may be able to take advantage of geographic space and also technology space such as patents and “expand and defend their position by blocking product space by broadening their product line”. A real life example of such a case is with Apple introducing the iPhone and signing exclusive carrier agreements with ATT, another large Telco in the

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US, thereby blocking many other phone manufacturers from taking advantage of their early entrance into the market. One important aspect of being a first mover according Marvin, B. L. and B. M. David (1998) is that customer preferences have been shaped to favor the pioneer's products. The iPhone again is an ideal example of shaping customer preferences. Once a customer gets hooked on the touch screen features and the applications bought, used or downloaded from iTunes, he is hooked through the proprietary applications and may even be further induced to buy other Apple products such as their Mac laptops in order to be further synchronized and for the sheer convenience of it all. The customer is "sucked into buying into other products even though Apple products are priced at least 20% above similar and competing products

### 3.0 Methodology

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*This chapter runs through the methodological approach to this theoretical reflections paper.*

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This paper is an Autoethnography as I will be writing about my own experience as a topic of investigation in its own right that explores my experience in starting up a new venture, start-up company Trafvid. I will leverage on previously-mentioned theories and draw both relevance and personal opinions and make a critical analysis about these theories in practice based solely on my experiences with Trafvid.

## 4.0 Analysis

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*This chapter presents my personal take away, reflections and critical analysis of past theories based on experiences with Trafvid.*

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### 4.1 Effectuation and Trafvid

With Trafvid, we are extremely good at being resourceful and leveraging on what we have in the best way possible. Using Sarasvathy's theory of effectuation, which states that "an effectuation process starts with what one has,(who they are, what they know, and whom they know) and selects upon possible outcomes" (Hisrich et al, 2010, p. 10) we at Trafvid try to endeavor to succeed in our new venture, using our individual talents (who we are), our innovative technology (what we know) and the network of contacts (whom we know) to establish and leverage our industry contacts and to jumpstart our customer base. Hence we can then tailor our decision making processes by "selecting the different possible means" of what projects to do for which customers in order to realize revenues and to grow our new venture. Thus we are very much deferring to Sarasvathy's effectuation process.

In fact there have been numerous instances when we had to defer to effectuation when we had planned to do something different in what would be otherwise considered as a causation process. My personal experience is that it has been a real challenge to come up with fixed long term market strategies. For instance, we had initially intended to focus on customers within Sweden as the market to launch our services but via the networks and contacts of our Swedish researchers, interestingly and rather ironically, we have had more initial interests from clients outside of Sweden. Our first customer has been A Finish Municipality and we are currently in discussion with A Swedish Municipality and in the future to make USA the next destination for getting in touch with potential customers. While it can only be good that we have interests outside of

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our initial target market of Sweden, it makes it almost impossible to plan. It would not take a genius to guess that this is one of the reasons experienced entrepreneurs do not wish to make business plans. Causation theory would suggest we make strategic and well thought out steps in targeting customers to reach the desired outcomes or goals but in reality especially for a start-up such as in our case this may not necessarily be the way (effectuation over causation).

However one must be careful not to assume that planning and strategy especially in the early start - up phase is not important. On the contrary, one still need needs to have a plan to reach certain milestones or goals along the way (even though this may eventually give in to the effectuation process). If one does not plan then they plan to fail because it's important to know or have a rough gauge as to where the company will be in the near future and which possible directions it may take. It's quite one thing to embark on an effectuation process and another to be aimless with no strategies and plans.

#### **4.2 Legitimacy and Trafvid**

In many instances, it's more often than not a challenge to get potential customers to buy into your product or services once they know you are a new venture or small start-up. It's a challenge that Trafvid has faced and will continue to face until we build up our customer base and become more established. This highlights the importance of legitimacy in embarking on a new business venture.

From my experience in Trafvid, we knew this importance and we strived in every way to increase our legitimacy. The business plan has been established as a as a symbolic tool according to Karlsson and Honig (2009) mentioned earlier, conforming to institutional pressures in an attempt to shore up legitimacy and create a base of credibility and trust. This has numerous implications for a new venture. For instance in the attempt to source for seed financing and venture capital, legitimacy is key and is if not more important than the business idea itself. Even though Trafvid has not the need

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for extra financing/capital at this current moment, we have observed how other start-up projects grapple with this obstacle. Banks that have given us talks have also stressed on the role that legitimacy plays in acquiring funding and loans.

Ruokolainen (2008) mentions that the background of the entrepreneur seems to have an effect on the success of the enterprise. He quotes from Freeser and Willard (1990) saying that startup companies which have entrepreneurs who have previously worked in the same industry tend to grow faster. Thus what this means is that the credibility and background of the entrepreneurs helps in building the overall legitimacy of the company that ultimately leads to success. From experiences with Trafvid, this could not be further away from the truth. In our case of Trafvid, one of the inventors is already working part time for a consulting engineering group with worldwide operations and being a professor at the university he has a huge and established network that Trafvid could leverage upon. In fact our first customer – A Finish Municipality was attained via contacts through this network and more recently, Trafvid had successfully completed a very positive meeting with A Swedish Municipality from within those very same contacts. We have also established contacts with numerous potential clients in the US making the US a possible market expansion strategy. Thus the importance that the background and networks of entrepreneurs play in building legitimacy can be seen especially when entering the market for the first time. Another member of the business team also has many years of selling professional services of IT solutions to large corporations so that would also be beneficial in our sales efforts when we launch our new company.

Also, customer reference was crucial in giving us credibility and in legitimizing our services which leads us to the next section.

### **4.3 Customer Reference and the role of trust for Trafvid**

Back in January 2011, Trafvid attended a Swedish Traffic Forum Trade Fair in Linköping. There the team met numerous potential customers and handed out our marketing peripherals (Brochures and Name cards). Since it was a local Swedish Trade fair we met customers from all over Sweden. This was a fantastic opportunity to initiate

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contact with potential customers locally within Sweden in the hope for them to spread the word of our existence and our service and product offering. Even in those circumstances where the attendees were not interested or had different problems to our offered solutions, I informed them of the possibility to pass the word around to those that might be interested since the traffic industry in Sweden is a rather small network and word of mouth travels fast.

This was the first step in initiating our first customer reference as mentioned by Ruokolainen, J (2008). As mentioned in this article the first customer reference is extremely crucial in building the market value of our company in terms of credibility and legitimacy. We shared the floor space with a consulting engineering group with worldwide operations which again as mentioned in an article by Doney et al(1998) was great as it added credibility and built up trust in our startup company which is relatively unknown and so needed to reduce the perceived risk by teaming up with an established company like the consulting engineering group with worldwide operations. The fair was a good personal experience as it allowed me the insight into the current Swedish traffic industry situation and as well as customer needs. Interacting with the potential customers and getting feedback was also very crucial in allowing for possible co-creation opportunities and ways to improve. As mentioned by Saras D. Sarasvathy in her talk given at Lund University on November 2010 for the Master Students of the Entrepreneurship program, the importance of co-creation with our customers is essential as not only a means to empower customers and reap the benefits that come with meeting customer needs and demands but also as a way to build trust and a healthy relationship with our clients.

On this note of trust and co-creation, we have learnt that customers must determine what we are "capable" of in terms of meeting their obligations and their expectations and this is intrinsically linked to how we communicate the solution package to them. In other words we build their expectations via our product/service offering through our business plan or via marketing and communication. A big part of trust is being able to deliver on our promises. To build up trusts takes a lot of work and comes with time but it can be lost within seconds. Thus it is critical to not to make promises if it cannot be met. Thus for instance, the business plan must not build false expectations and there is a

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need to carefully manage expectations so that is not at the level which is too high but instead to keep it realistic and pragmatic and ensure that we deliver on the solutions that we promise. Trust also facilitates long-term relationships between firms and is an important component in the success of strategic alliances and relationship building with all stakeholders and not just customers. Within organizations, trust contributes to more effective implementation of strategy, greater managerial coordination, and more effective work teams.

As mentioned earlier according to Doney et al (1998), trust is closely intertwined with society's culture. Thus in our attempt to commercialize TRAFVID and successfully bring it into the market here in Sweden, we have learnt to pay close attention to the corporate culture in order to gain a certain level of trust that would build and maintain long-term relationships which in turn lead to a successful venture.

Ruokolainen (2008) tells us "that with high technologies and complex product systems, long-term cooperation between the buyer and seller is necessary. Intensive cooperation and open knowledge sharing are often required right from the research and development phase". In the traffic analysis industry, we the entrepreneurs need to continuously cooperate with our potential customers (the traffic consultants) since we rely on them to recommend our solution to their clients. These traffic consultants have their eyes and ears to the ground when it comes to their knowledge of what the customers need and want. Hence it would be prudent on our part to heed their advice on what to include in our product/offering in order to maximize the value to our future customers. And in doing so we generate a positive customer feedback and appraisal cycle as we only maximize our chances of generating customer satisfaction and positive customer references which in turn lead to more customers. This serves to highlight the importance of co-creation and working closely with customers in an open relationship in building up trust and positive customer references which ultimately help achieve sustained competitive advantage.



#### **4.4 First-Mover Advantages for Trafvid**

As mentioned, Marvin, B. L. and B. M. David (1998) state that FMs may be able to leverage upon of geographic space and technology space with Intellectual property rights (IPR) and influence customer preferences to sustain competitive advantages. In the case of Trafvid, we can be considered as first movers since there are no direct competitors currently in Sweden that offer our service. However, since there has been many years of research behind Trafvid and because papers have been published there are no real IPR concerns or need for patents but being FMs is nonetheless crucial in gaining market share and shaping customer preferences and attitudes. For a new entrepreneur in Sweden, which in essence is rather homogeneous; one would think that FMA would be even more advantageous, given that Sweden also has a smaller population. Furthermore, if there are any FM disadvantages then this is reduced by the fact that our technology while new is not revolutionary but rather evolutionary from what others can provide. Thus with this in mind it was critical that we move as fast as we can through the start - up phase starting with the Swedish Traffic Forum Trade Fair in Linköping to try to get as much customers on board as fast as our resources would permit. Also gaining access to international projects like our first customer – A Finish Municipality and in general projects outside of Sweden could also act as a big plus point when it comes to credibility and legitimacy. If we could crack into the US market sometime in the not too distant future that would be even better not just to enjoy FM benefits but also to build up our professional reputation as start up with an international portfolio.

## 5.0 Conclusions

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*This last chapter presents concluding remarks.*

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The aim of this theoretical reflection is to share with those who may be interested how entrepreneurial theories are experienced or applied in one way or another in reality. This was done via my personal reflections and thoughts with regards to starting up Trafvid and how it relates to theories that I find most prevalent with regards to my new venture experience. I believe that I have succeeded in giving the audience a brief glimpse into the entrepreneurial world and how certain theories or entrepreneurial applications may or may not be translated into reality or the way it was expected as mentioned in books or theoretical literature. Entrepreneurship is very much a hands-on experience and many a times it depends on circumstances and even luck. However being armed with entrepreneurial literature and theory gives one the tools needed to be better prepared for uncertainties and obstacles that every entrepreneur is bound to face. My advice is that the first important prerequisite to being a successful entrepreneur is to not be afraid especially of making mistakes as Adam Osborne (American entrepreneur, 1939-2003) would say “The most valuable thing you can make is a mistake – you can’t learn anything from being perfect.” I do hope that my reflection will help in one way or another and inspire those who have their heart and minds set on becoming an entrepreneur. I would like to conclude with one last quote from Steve Jobs (American Entrepreneur and Apple co-Founder),

“Your time is limited, so don’t waste it living someone else’s life. Don’t be trapped by dogma – which is living with the results of other people’s thinking. Don’t let the noise of other’s opinions drown out your own inner voice. And most importantly, have the courage to follow your heart and intuition. They somehow already know what you truly want to become. Everything else is secondary.”

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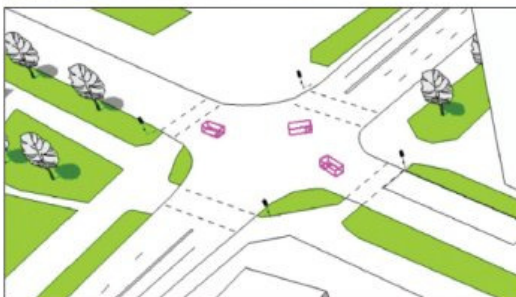
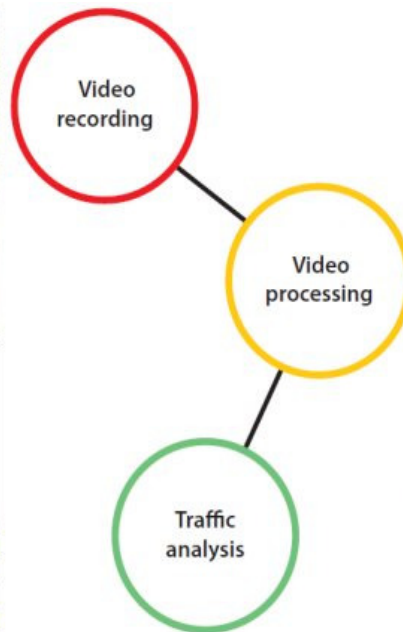
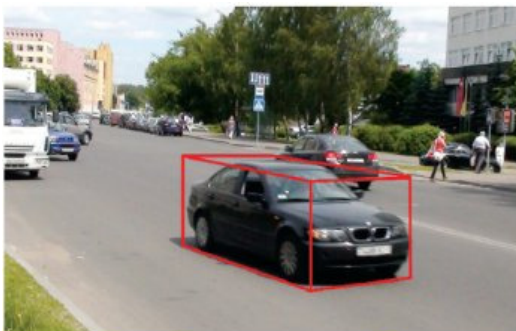
## BUSINESS PLAN

May 6<sup>th</sup>, 2011

Janice Tan & Jeremiah Dorai



## INTELLIGENT TRAFFIC ANALYSIS – Through Automated Video Processing



This business plan is submitted to Professor Tomas Karlsson, for BUSP01 Degree Project, Entrepreneurial Project-Master Level, School of Economics and Management, Lund University, Sweden.

## **BUSINESS PLAN**

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## **Business Plan Objective**

The aim of this business plan is purely for grading purposes and academic review. The other important objective is to allow the entrepreneurial team to have a road map of what to do, where to go and how to get there. (Hisrich et al 2010 pp 185) A business plan also provides legitimacy. According to Zimmerman et al. (2002), "legitimacy is a resource for a new venture – one that is at least important if not more than other resources like capital, technology, personnel, customer goodwill and networks".

Using Sarasvathy's theory of effectuation, which states that "an effectuation process starts with what one has,(who they are, what they know, and whom they know) and selects upon possible outcomes" (Hisrich et al, 2010, p. 10) We the entrepreneurs endeavor to succeed in our new venture, Trafvid, using our individual talents (who we are), our innovative technology (what we know) and our CTO and CIO's network of contacts (whom we know) to establish and leverage our industry contacts and to jumpstart our customer base. Hence we can then tailor our decision making processes by "selecting the different possible outcomes" of what projects to do for which customers in order to realize revenues and to grow our new venture.

## **Executive Summary**

Trafvid provides a complete set of services related to the use of video in traffic studies, from experiment planning and camera installation to intelligent automated processing and analysis of the results. Trafvid is the name of our solution and is also our company name. We are a Lund University Innovation spin off company commercializing the results of at least two decades of research at Lund University, regarding the use of video in traffic analysis

Our core competence is to provide technical services using our special algorithm and state of the art software in analyzing the collection of detailed traffic data by utilizing automated video recordings and video analysis. What makes our solution different? Trafvid can detect and track vehicles, cyclists and pedestrians and measure their speed and acceleration with high accuracy. Our customers would be

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road and infrastructure planning, civil engineering companies, university traffic engineering faculties and municipality traffic planning departments.

We will provide analysis and consulting between 850 to 1000 SEK per hour depending on the complexity of the projects. We have our first customer, the \_\_\_\_\_ Municipality. There are also pending projects with \_\_\_\_\_ Municipality, X Company and Y Company in Sweden. See Letter of Intent (LOI) in the Appendix.

The value we bring to our customers is that of cost savings in terms of not having to hire people to observe and count traffic when monitoring intersections. Our Traffic consultants are experts in the field of Traffic Analysis. Our innovative solutions eliminate the problem of human error when people are hired to observe traffic behavior. Trafvid significantly improves the process and accuracy of traffic analysis. We provide accurate data which in turn can save lives when roads and intersections are made safer through improved road planning.

**Organization (Team)**

The product technology originates from the research collaboration of the Departments of Technology and Society and Centre of Mathematical Science at Lund University. Our technical team of consultants includes Aliaksei Laurelshyn, Assistant Professor and Thomas Jonsson, Associate Professor, at LTH School of Traffic and Roads. Janice Tan and Jeremiah Stephen Dorai are from Lund University’s Master Program in Entrepreneurship. They form the Business Team and provide all essential activities related to business strategy and development, marketing and sales functions. David Svensson our Chairman of the Board also serves as mentor and business advisor. A mentor is instrumental in helping a new venture, “contributing important skills to the new venture’s achievement of planning goals and who will show good judgement in business decision making” (Hisrich et al, 2010, p. 273).




**Background & Description of Trafvid Team**

<b>Team Members</b>	<b>Background and description of role in TRAFVID</b>
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	<p><b>Janice Tan</b> is the CEO. She has experience in consultative software sales &amp; technical consulting services of Enterprise Software Solutions for Fortune 500 companies such as Rational Software (now IBM) Mercury Interactive (now HP), as well as optimizing the sales performance of Swedish &amp; American IT teams. As the CEO, Janice oversees strategic planning and execution of activities within TRAFVID. She is also responsible for the realization of sales, marketing and revenue objectives. She is currently enrolled in the Master program in Entrepreneurship at Lund University. In 2009, she was in the Master program in International Economics with a Focus on China, at Lund University.</p>
	<p><b>Jeremiah S Dorai</b> is in the Business Development and Strategy role. His main focus is on financing/ accounting, marketing and promotional efforts. He is currently enrolled in the Lund University Master Program in Entrepreneurship. Jeremiah has studied in Singapore &amp; the Netherlands prior to studying for his first Masters in Corporate &amp; Financial Management at Lund University. His expertise is in accounting, finance, operations &amp; logistics. He also has prior experience running his own start-up.</p>
	<p><b>Thomas Jonsson</b>, PhD is the Chief Information Officer. He is an Associate Professor in the Department of Technology &amp; Society, Faculty of Engineering, Lund University &amp; also a Project Manager in Traffic Engineering at the consultancy company Ramböll Sweden AB. Thomas has a main research focus on traffic safety analysis &amp; has applied video analysis as a tool in different studies of safety &amp; traffic operations. His role in TRAFVID includes establishing the customer base through his extensive network and contacts in the Traffic Administration both in Scandinavia and abroad.</p>

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	<p><b>Aliaksei Laureshyn</b>, PhD is the Chief Technical Officer. He is currently an Assistant Professor at Lund University, Faculty of Engineering, LTH, Department for Technology &amp; Society, Traffic &amp; Roads. Aliaksei has been working with video analysis in traffic applications since 2004 &amp; his doctoral thesis is the foundation for TRAFVID. He has extensive experience in the practical application of video analysis technology, from camera installations to video data management, processing &amp; interpretation of the results. His main role in TRAFVID is to oversee and maintain all technical aspects of the software and service offerings.</p>
	<p><b>David Svensson</b>, Chairman of the Board and Business Advisor/Mentor. He studied at Lund University LTH in Computer Engineering, Physics and Electronics. David has extensive experience in electronics design, application software and mobile communications at National Semiconductor, Ericsson &amp; Sony Ericsson. He is also founder and CEO of Itinerary Systems, known later as Wayfinder Systems (IPO in 2005). David is an engineer and successful entrepreneur. In his capacity as Chairman of the Board, David plays an active role in contributing his technical expertise and business acumen to our new venture.</p>

**Team Profile Matrix**

Scale from 1 to 5 with 5 being the best	"Hard Factors"					"Soft" Factors			
	Technology	Finance	Project Management	Relationships/Networking	Sales & Marketing	Social Skills	Initiative	Communication	Negotiating Skills
Janice Tan	3	4	4	5	5	5	5	5	5
Jeremiah Stephen Dorai	3	5	4	4	3	4	5	5	4
Aliaksei Laureshyn	5	3	4	3	3	3	5	5	4
Thomas Jonsson	5	3	4	5	3	5	5	5	4

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### Learning Styles (Honey and Mumford's model derived from Kolb)

Type	Characteristic	Team Members
Activist	Prefers doing and experiencing things	Janice, Aliaksei
Reflector	Likes to observe and reflect	Aliaksei, Jeremiah
Theorist	Wants to understand underlying reasons, concepts, relationships	Jeremiah, Thomas
Pragmatist	Likes to have a go; to try things to see if they work out	Janice, Thomas

The Trafvid team's education, skills and core competencies complement one another(see Learning Styles Table above) As a team, we not only have the necessary skills, the talent and the technology, we also have the passion, and the synergy that is vital for a new start technology venture such as Trafvid. Education is important in the upbringing of the entrepreneur in that it plays a major role in helping the entrepreneurs cope with the problems they confront. (Hisrich et al, 2010 ,p 38)

### Company Mission and Goal

Trafvid's mission is to provide intelligent traffic analysis via video processing, not only to enhance today's less efficient methods, but also to improve infrastructure and traffic planning in order to significantly improve safety standards, reduce accidents, decrease traffic conflicts and thereby save more lives.

We aim to build a team of world class traffic analysts for automated video analysis. Our objective is to be the industry leader in providing advanced traffic analysis solutions. Via TRAFVID, we hope to provide a safer environment for road users by helping to improve the planning of traffic intersections, roundabouts and other infrastructure.

Trafvid is a spin- off company from Lund University Innovation. It is an example of the partnership between Academia and Industry, transforming innovative University research into viable and successful ventures.

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#### Business Model

We will start by providing technical services for implementation of our Trafvid software and analysis. We will charge an hourly basis of 850 – 1000 SEK for our consulting fee. (See Market Analysis and Potential Revenue Table and Revenue Tables).

#### Business Idea

Our Intelligent Traffic Analysis solution is the result of 2 decades of research by our team of talented researchers specializing in Traffic studies at Lund University's Department of Technology and Society and Centre of Mathematical Science. We plan on commercializing this research into a viable business called Trafvid.

#### Uniqueness

Trafvid utilizes state of the art algorithms and techniques for automated video analysis, enabling us to record 3-4 months of video for the customer. By letting computers do most of the work, we reduce the amount of manual labor that is often a cost prohibitive factor in traffic studies. For a demo of our application, please see [www.Trafvid.com/Demo.html](http://www.Trafvid.com/Demo.html).

We do not plan to patent our technology at this moment, since in doing that, we would have to disclose more proprietary information that might be taken advantage of by our competition. We have, however, published several research papers which the Traffic Industry and public can access. Our algorithm and cutting edge technology is inimitable, hence a patent is not necessary.

#### Customer Value and Benefit

"My dream has been for long that \_\_\_\_\_ City Planning Department would have a video analysis program for all kind of traffic studies."

\_\_\_\_\_ from \_\_\_\_\_ Municipality

At the moment, collection of detailed traffic data is done in a very limited scope. In most cases it has to be done manually. Often it is not done at all due to high costs involved. Reliable and sufficient amounts of data are crucial in order to determine the quality of the traffic modeling results. There is increasing interest and significant need among traffic consultants and researchers who work with traffic

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modeling to have a tool that can collect more accurate data on a tighter budget. Trafvid bridges the gap and provides a cost effective solution. Though there is strong agreement between traffic researchers about the advantages of the safety forecasts based on rare events in traffic (e.g. serious conflicts), such methods have not become a routine in traffic analysis due to costly and time consuming method of hiring people to observe accidents at intersections for however long it takes. Our system is able to analyze long-time recordings and automatically detects traffic conflicts and that in turn reduces manual costs.

#### Advantages for the Customer

- Data collection made cheaper and requiring less manual labor (up to 90% reduction in manual labor in not having to hire people as observers and to manually count traffic). Our video recordings can provide more reliability, accuracy, consistency during longer periods of up to 3-4 months.
- Ability to follow the vehicle through the whole area of interest and analyze events in this area.
- Analysis of near crashes, rare events and traffic behavior.
- Our software housed in cameras recording from multiple angles increases measurement accuracy
- Dramatic reduction of manual labor in observing and analyzing traffic behavior, which in turn reduces human error
- Ability to analyze the behavior of cyclists and pedestrians, not only vehicles
- Can record up to four months of video footage in a session, thereby reducing costs of having to hire people as observers and to count traffic

#### Competition in Europe

\_\_\_\_\_ in Germany uses traffic simulation models to analyze traffic and the other, \_\_\_\_\_, in Belgium, uses a less advanced technique to analyze real traffic data. \_\_\_\_\_ solution can only analyze certain zones in the area they are monitoring. That method of using only one camera, can only detect if a vehicle passes the zone in question, they cannot follow the vehicle as it moves. These companies do not offer an exact solution to the extent we can with automated video processing (see our advantages) We also do not do simulation models so in essence ,we are not really competing in the same market segment as \_\_\_\_\_

### **Competition in Sweden**

\_\_\_\_\_ in Sweden is the closest competitor in that they also do video analysis. Hence they are our top competitor in Sweden and at present the only company which does video analysis, so they have the entire market share of video analysis in Sweden. Their projects involve mainly traffic counts and they analyze the direction of the detected objects (cars), not only count passages over a stop line. Our solution is far superior to \_\_\_\_\_ in that we can analyze longer periods (weeks, even months) and detect events that are quite rare (such as cyclists going in the wrong direction) and we can produce the footprint of road users on the road – necessary.

### **Development Stage of Trafvid**

The software that manages the output from the video processing program is 100 percent customer ready. The software has been utilized in real life scenarios in Sweden on two different occasions. One of the projects was to analyze the bicyclist's effect on traffic while going against one-way streets in Stockholm. The goal of the project was to analyze this effect and to make Stockholm a bicycle friendly city. Trafikkontoret in Stockholm was very satisfied with the results that our video analysis captured the conflicts between cars and cyclists, thereby allowing Trafikkontoret to design safer roads for pedestrians and cyclists. They have indicated that they would definitely use Trafvid in the near future when it is time for implementation of their plans. The other study was conducted in Lund, where we analyzed roundabouts and the traffic behavior of vehicles, bicyclists and pedestrians. The goal of this research was to improve the safety for cyclists and visually impaired in roundabouts. Lund Trafikverket which sponsored the PHD research project for this study was very satisfied with the results. The supervisor of the project, a collaboration between Lund University and Lund Trafikverket, had this to say:

"Automated video analysis is a new valuable tool in studies of traffic. The situation where we spent weeks watching and observing traffic is now history. Instead, you can record for months and let computers do the job for you."

*Professor Emeritus Christer Hydén Technology and Society, Lund University*

## Marketing Plan

### Target Market

We will target the Swedish and Scandinavian market first since this is the area where we have the most knowledge and experience. Thomas Jonsson, our CIO has contacts with various regional Traffic Administrations and we can utilize existing relationships and contacts for our initial customer base.

- Infrastructure planning departments of state, city & municipalities
- Civil and structural engineering firms
- Traffic consulting firms
- Collaboration with other leading traffic analysis software providers to enhance their product offering, by using real field data for simulations/model validation

### Initial Customers

There are three big consultancy firms such as \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ working with traffic analysis in Sweden, none of which have yet to use automated video analysis to the extent that Trafvid can provide. Most are using people to count traffic. We could collaborate with them in providing our traffic analysis system to their customers. This would be a good way to introduce our product to the market. We also recently attended Sweden's largest Traffic Forum the VTI TrafikForum in Linköping this January. We shared the booth with \_\_\_\_\_ and many people stopped by our TRAFVID booth. We talked to many potential customers who expressed an interest in our solution and we have now been working on several leads for potential business.

The \_\_\_\_\_ Municipality will be our first customer. They want us to conduct a "before and after" study of a roundabout that is being narrowed to reduce speed of vehicles and to make it safer for cyclists and pedestrians. We have a verbal agreement to do the project- We can use this as a customer reference and as a stepping stone into the \_\_\_\_\_ market. Ruokolainen (2008) tells us that "the next potential customer may appreciate the credibility gained from the first customer reference more than the innovativeness or low price of the new product. The importance of the first customer reference is undeniable and that the first customer reference is essential in attaining the necessary credibility to convey trustworthy market messages."

**Market Analysis and Potential Revenue**

(Based on the estimated budget allocation of the Swedish Trafikverket	Swedish Market (Total) MSEK	Growth %	Trafvid Market MSEK	Trend	Target Market and Segment
Research projects	200	10	1	↗	Video analysis is used as a tool in complex research project. Infrastructure planning departments of state, city, municipalities, Road Administration, . 2-4 projects per year, our share about 300-500k SEK per project
Evaluation studies	100	10	3.2	↗	Medium size projects. Financed by large municipalities, road administration. 200-400k SEK per project. 6-8 projects per year.
Validation of traffic models	50	5	2.9	↗	Traffic consulting firms. Small projects, 1-2 days filming. 50-80k SEK per project. 2-3 projects per month
General and Collaborative Projects	20	5	1	↗	All miscellaneous projects related to traffic analysis & Collaboration with other leading traffic analysis software providers to enhance their product offering
Total Market Potential			8.6		



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**Implementation**

Activity	Months (Starting from April 2011) →	2011												2012											
		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1. Incorporation of TRAFVID AB		→																							
2. First Customer		→																							
3. Prospecting other customers			→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→			
4. Software Optimization & Upgrades																									
5. Hiring & Training Personnel																									

We are also in the discussion with \_\_\_\_\_ - and other companies regarding the use of video analysis to monitor some of the intersections, roundabouts and roads that they are working on for their consulting projects.

As a result of these future projects, we plan on further software optimization and upgrades to accommodate customer requests. As we continue to have additional customers and projects, we need to hire more personnel. Recruitment can be from the pool of graduate students at LTH who are interested in video analysis as part of their traffic studies.

**Risk Analysis**

**SWOT (Strengths, Weaknesses, Opportunities and Threats)**

**Strengths**

- First in the market to introduce a video analysis system that can record up to 4 months of footage.
- 90% reduction in manual labor leading to estimated cost savings
- Video software is 100 percent ready and has been used in 2 successful trials in Stockholm and Lund
- \_\_\_\_\_ as first customer
- Established contacts within the Swedish Traffic Administration market
- Conducted 2 successful trials in Stockholm and Lund which shows that Video Analysis plays an integral and important part in getting accurate and reliable results in traffic studies

**Opportunities**

- Pending Sales with
  - X company
  - Z company

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- \_\_\_\_\_Municipality
- Close ties to \_\_\_\_\_ and the opportunity to work with them as a subcontractor.

### **Weaknesses & Threats**

- Lack legitimacy by being a new company with new entrepreneurs.

**Action:** Working with\_\_\_\_\_ provides legitimacy for Trafvid and Trafvid is currently working on an aggressive marketing plan to target new customers. Attended the VTI Transport Forum in Linköping on January 12-13th (see Appendix)to introduce Trafvid.

- Limited manpower so Trafvid can only accept projects that it has the capacity to handle.

**Action:** As the business grows, additional manpower will be hired from the pool of graduate students at LTH.

- Threat of New Entrants

**Action:** The race against time to market is crucial. We want to establish first mover advantage in implementing Trafvid. According to Liberman et al, (1998), the first mover advantage enables the first mover to gain customer loyalty by being the first in the market.

### **Economical Benefits & Sustainability**

We believe that our traffic analysis system has more advantages than any other existing system. Our value added is that we have a team of traffic analysis experts to provide professional expertise in analyzing the data that can be collected by our automated system. By helping cities to be bicycle friendly, we can encourage more people to reduce their dependence on cars, thereby improving air quality. Video analysis can help to improve road planning and prevent serious conflicts from occurring, making it safer for all of us who use the roadways every day.

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### **Exit Strategy**

At the present moment, the owners of Trafvid want the majority of the company to be privately owned. In the future, depending on growth revenues, we might consider a trade sale.

## Appendix

### Letter of Intent (LOI)

Company	Consulting Project
Municipality	Monitor intersections
X	Monitor roundabouts and intersections
Y	Monitor sections of two roads

### Profitability and Financial Information

#### Table 1. Consolidated Profit and Loss Account

Proprietary info not to be made public

### Cash Flow Analysis

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VTI Transport Forum

At Linköping, Sweden January 12-13, 2011



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